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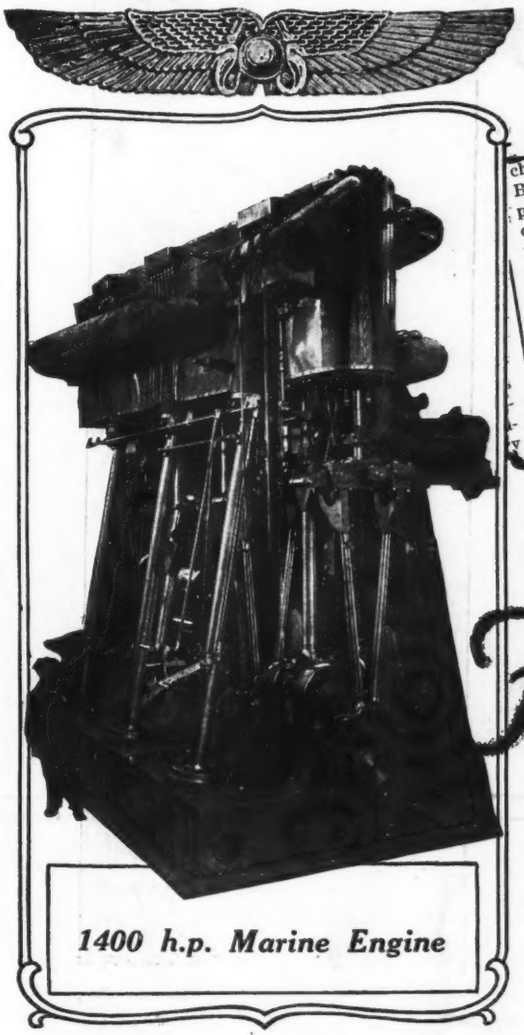
Engineering and Mining Journal

McGraw-Hill Co., Inc. Price, 20c. New York, January 18, 1919



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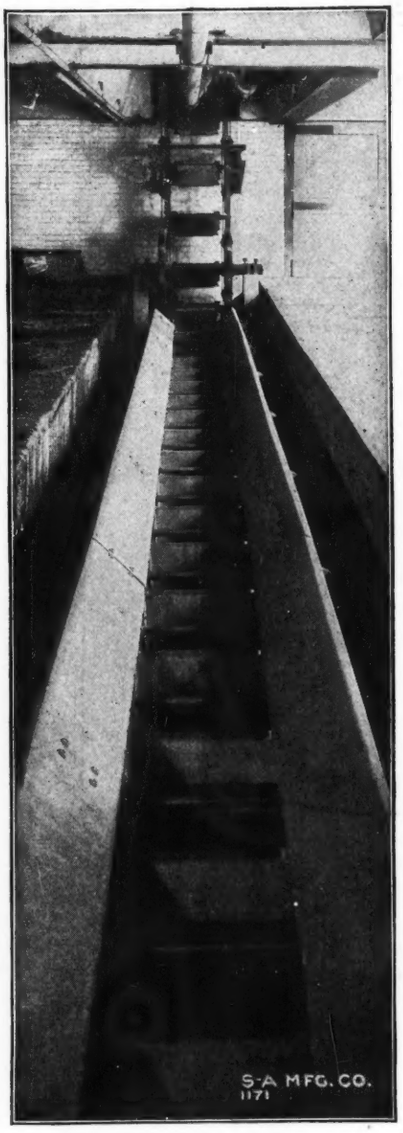

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Engineering and Mining Journal

January 18, 1919

Volume 107 *Number* 3

Rossiter W. Raymond

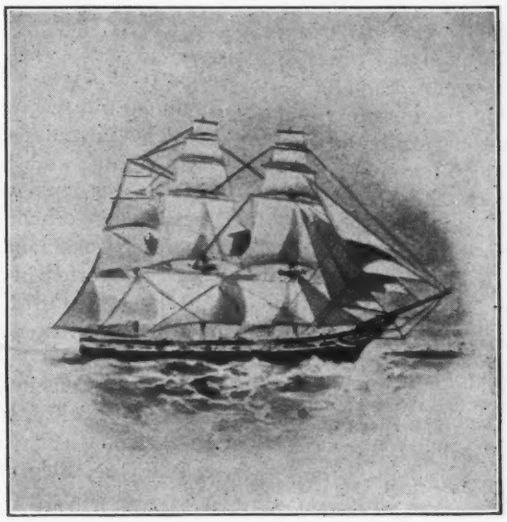
A MEMOIR BY W. R. INGALLS

AS LONG as 35 years ago Raymond was already a legendary character. There were not many mining engineers in this country at that time, and most of them were young men who had been graduated after the Centennial. There was a small number of men who had been schooled at Freiberg in the '60s. These were the revered seniors of the new profession, and among them Raymond was preëminent. His merits were distinguished. He had had a picturesque career. He had filled several public positions that had caused attention to be focused upon him. Long before that time he had become the most conspicuous among mining engineers. His colleagues admired him. The young fellows looked up to him as one standing on the heights. As one of those young fellows, I first met him at Leadville, in June, 1889, which was visited by the Institute in the course of its 54th meeting. The honor of an introduction to this famous man overwhelmed me, and I well remember the awe that I felt in entering his private car. It seems to me that during our subsequent acquaintance, and later friendship, of nearly 30 years, he never changed greatly in appearance from that day. He never seemed to grow very old in looks, and certainly in spirit he did not. At the particular time of my first meeting with him he was in the midst of a game of chess, and I do not think he relished the interruption, although he pretended it did not matter. However, it was my good fortune soon to come close to him when late in 1890 I came to New York to assist Rothwell on the *Journal*, and the latter, departing for a prolonged journey, enjoined upon me to look to Raymond as a guide, philosopher, and friend, and until I left the paper in 1892 we had such association.

Rossiter Worthington Raymond was born in Cincinnati in 1840, son of Robert Raikes Raymond, a descendant from Richard Raymond, who came from England to Salem, Mass., about 1632. His mother, Mary Ann Pratt before her marriage, came also from an old New England family. Rossiter was the eldest of a family of seven children. He received his early education in the public schools of Syracuse, N. Y., whither his parents had removed, and in 1857 entered the Brooklyn Polytechnic Institute, of which his uncle, Dr. John Raymond, was then the president. Graduating from that institution in 1858, at the head of his class, he set out for Europe to continue his studies, taking passage in the clipper ship "Great Western," of the Black Ball line. Before the long and disastrous voyage was over Raymond had become the third mate, and the crippled ship, with half a rig and half a crew, and on half allowance of water, finally crawled down through the Irish Channel to Liverpool, a surprise to her underwriters. That was a stirring experience for a lad of 18, who manifestly exhibited the stuff that was in him to be appointed an officer out of the passenger list.

Landing in Europe, Raymond entered upon studies at Heidelberg and Munich, but especially at the Royal Mining Academy at Freiberg, where he remained until he completed them; whereupon he returned to the United States in 1861, and in August of that year entered the Federal Army, serving as aide-de-camp,

FREIBERG, 1860-1861



THE "GREAT WESTERN," 1858

FEDERAL ARMY, 1861-1864

with the rank of captain, on the staff of Major-General Fremont. During the campaign in the Valley of Virginia he was officially commended for gallant and meritorious conduct.

Retiring from the Army in 1864, he entered upon the practice of his profession as mining and metallurgical engineer in New York. Whether he formed his association with Dr. Justus Adelberg at once, or a little while later, I do not know, but, anyway, it was not long before the firm of Adelberg & Raymond was organized and was doing a rushing business. This was almost coincident with the birth of the mining industry in the United States. Indeed, except for gold mining, mostly placer, in California, and lode-mining on the Comstock, which had been discovered in 1859, there was no extensive mining going on in the great region west of the Rocky Mountains. The prospecting that was to result in the discovery of the rich ore deposits of Eureka, Nevada, and the Cottonwood Canyons, in Utah, was just being begun in 1863-64, but the curtain of the stage of active mining was not to be raised for five years. Further east there was mining for copper in the Lake Superior region, and lead mining on a small scale in the Mississippi Valley. The St. Joseph Lead Co. and the Granby company, to mine for lead and zinc, respectively, in Missouri, were just being organized. Truly, Raymond entered upon the practice of his profession at a psychologic time. Equally so was the institution, in 1866, of the *Engineering and Mining Journal*, in which Raymond naturally became quickly interested. It will be best to carry on this part of the story of Raymond's professional career in his own words, quoting from some reminiscences that he contributed to the paper upon its 40th anniversary. The paper was known for a year or two as the *American Journal of Mining*. Raymond wrote:

So far as I can recall, my own connection with the enterprise began with the contribution to the *American Journal of Mining* of a series of articles running from Apr. 27 to June 8, 1867, entitled "A Comprehensive View of the History and Present Standpoint of Geology, Being the Introduction to Prof. Bernard Cotta's New Work, 'Die Geologie der Gegenwart,' translated by Adelberg & Raymond, Mining Engineers."

Dr. Justus Adelberg, my business partner at that time, was an accomplished chemist and technologist, who had also acquired by personal experience considerable knowledge of mining conditions on the Pacific Coast. I was a young beginner, with nothing but my education at Munich and Freiberg, and my service (occasionally in the line of engineering) in the Union Army to qualify me for serious professional work. Adelberg's advice was, of course, invaluable to me. It was at his suggestion that I made the translation from Cotta, mentioned above, and gave it to the *Journal*, partly to help that enterprise and partly (perhaps chiefly) to advertise our firm.

Those were the days when mining experts were scarce and were eagerly employed. For some years Adelberg & Raymond did an immense business. Hermann Credner (afterward professor of geology in the University of Leipzig, and directer of the Saxon Geological Survey), Anton Eilers (famous now on his own account as metallurgical authority and captain of industry), Chas. A. Stetefeldt, O. H. Hahn, and others who subsequently distinguished themselves in American mining and metallurgy, were first employed as assistants by the firm. For some time my personal work was largely that of superintending the labors and editing the reports of such men, with only occasional opportunity for professional field work of my own. My prospect of gaining such needed contact with actual conditions and practice was further diminished when, as the consequence of my published translation from Cotta, I was requested by Western & Co., the publishers of the *American Journal of Mining*, first to contribute anonymous editorial paragraphs and afterward to assume publicly the position of editor. I did not replace, or immediately succeed, Mr. Dawson. There was an interregnum of one six-months' volume, during which Western & Co. were announced as "Editors and Publishers," and I did more or less editorial work for them.

My editorship of the *Journal*, which might have deprived me permanently of the benefit of actual practice, unexpectedly led to the contrary result. Certain articles of mine on the relations of the Federal Government to the mining industry on the public domain attracted the attention of some of the senators from the Pacific states; and in 1868, when Ross Browne was suddenly appointed U. S. Minister to China, I was invited to Washington, and, after a conference, was appointed to continue his work as U. S. Commissioner of Mining Statistics. Such an honor and opportunity could scarcely have come to a young man of 28 in any other way; and I have always regarded my connection with the *Journal* as a principal source of whatever subsequent professional knowledge and influence I was able to achieve.

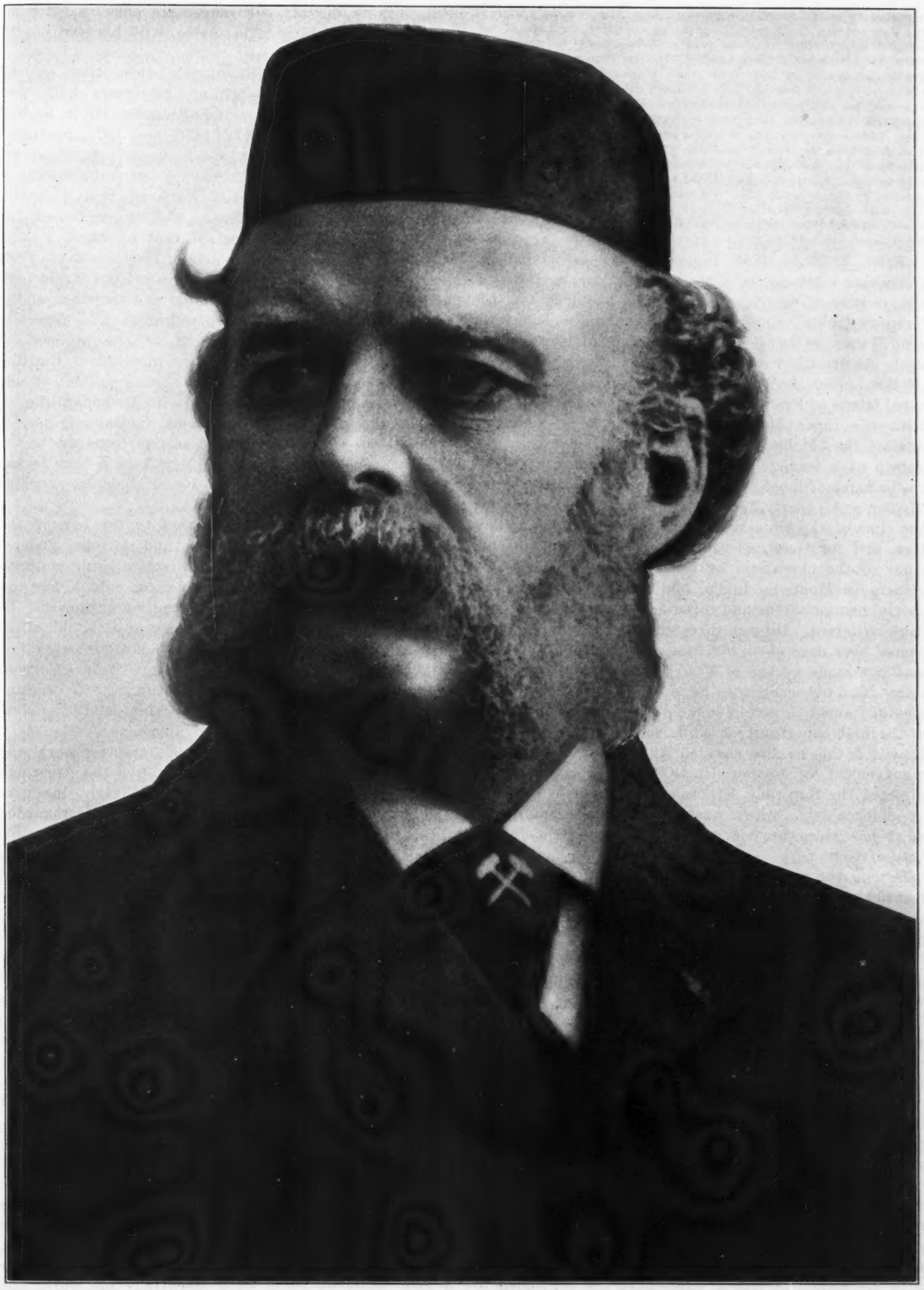
During the years which followed I practically edited the *Journal* with one hand, while discharging official duties and earning my living by professional work with the other. This was not altogether good for the *Journal*. I could have done better work there if I had not been forced to do so much elsewhere. On the other hand, the *Journal* could not support me, except as it gave me a prestige which commanded other income for its support as well as my own. First and last, it cost me about $30,000—all of which, in my judgment, my connection with it enabled me to earn otherwise—so that I considered the outlay fully justified. It was not until Mr. Rothwell took the business in hand that it began to be really profitable and to realize the conception which I had cherished concerning it, but for lack of time and money had always been unable to realize.

It was Mr. Rothwell who, by urgent personal appeal, induced me to attend the famous Wilkes-Barre meeting of 1871, at which the American Institute of Mining Engineers was organized. Unknown to either of us, this was the "parting of the ways" in our business relations—though there was never such separation in our friendship. Curiously enough, he, who had been one of the founders of the Institute, devoted himself supremely in later years to the *Journal*, while I, who had assisted the infancy of the *Journal*, have given my life to the Institute. I feel sure that the *Journal* did not suffer by this exchange, and I am as heartily proud of its subsequent success as if I had had more to do with it.

Raymond did not overdraw the activity of this period of his life. Besides the two responsible positions that he was filling, and his interest in the Institute and private professional work, he accepted an appointment as lecturer on economic geology at Lafayette College, and occupied that chair until 1882, while for one year during that period he gave the entire course on mining engineering. In 1873 he was appointed U. S. Commissioner to the Vienna Exposition, and as such delivered at Vienna addresses in the German language at the International Convention on Patent Law, an address at the International Meeting of Geologists, and an address in English at the meeting of the Iron and Steel Institute, in Liège, Belgium. During this period, however, it was his work as U. S. Commissioner of Mining Statistics, recorded in eight classic volumes, 1869-76, that stands out most prominently. The technical library that possesses the complete set now deems itself fortunate. Respecting this work and this period generally I may be permitted to quote from an editorial in the *Journal* published following a memorable occasion:

The celebration of Doctor Raymond's 70th birthday makes an appropriate occasion for the *Journal* to express its appreciation of the high services that in a professional career of nearly 50 years he has rendered to the mining industry of the world, its recognition of his help in advancing the standing of the profession of mining and metallurgical engineering, and finally its own respect that is due to him as a father, because, although he was not the first editor of the *Journal*, it was certainly he who shaped its editorial policy into that form which has come down as tradition and precedent. Raymond became editor of the *Journal* on July 13, 1867, and continued in that position until 1874, when the multiplication of his other duties necessitated his withdrawal from sole editorial control. He became, then, joint editor with R. P. Rothwell, this arrangement extending into the '80s, and finally a special contributor. Up to the present time no volume of the *Journal* has ever been published which has not contained some contribution by him.

The major portion of Raymond's sole editorship of the *Journal* was contemporaneous with his filling of the position of U. S. Mining Commissioner, and during that time he produced those wonderful volumes upon the mineral resources west of the Rocky Mountains which are the admiration of everyone who has had



ROSSITER W. RAYMOND

occasion to study them. Respecting them, the present editor of the *Journal* can speak with peculiar appreciation, because of the minute examination of them that was necessary in connection with an historical investigation. No one better than he can praise the beauty of their style, their language always clear, incisive and easily flowing; the accuracy of the descriptions, the keenness of the perception manifested throughout, and the remarkable prophecies that had to await only a few years for their fulfillment. Written 40 years ago, when the Pacific railway had just been completed, and the Great American Desert was receiving the first strokes of development, especially as to its mining industry, these volumes can be read with almost as much interest today as when they were penned, and they may be read also with profit. No other country possesses such a chronicle of the development of its mining industry, and we may rightly esteem these volumes as classics of mining literature.

From 1875 to 1895 Raymond was associated, as consulting engineer, with the firm of Cooper, Hewitt & Co., owners of the New Jersey Steel and Iron Co., the Trenton Iron Co., and the Durham and the Ringwood Iron Works, as well as numerous mines of iron ore and coal. As president of the Alliance Coal Co., and director of the Lehigh & Wilkesbarre Coal Co., and as a personal friend of Franklin B. Gowan, he became acquainted with the inner history of the memorable campaign against the "Molly Maguires," and ever since has been known as a fearless opponent of all tyranny practiced in the name of labor. His articles on "Labor and Law," "Labor and Liberty," etc., published in the *Journal* at the time of the Homestead riots, attracted wide attention, and for these, as well as similarly frank discussions of the operations of the Western Federation of Miners in Montana, Idaho, and Colorado, he received special denunciations and threats from the labor unions thus criticized. He was threatened with hanging if he should ever dare show his face in Butte, but Raymond was not made of the stuff to be scared by any such talk. On the contrary, he often expressed himself gleefully about it, and he made a point of visiting Butte at the first opportunity. While connected with Cooper, Hewitt & Co., he also assisted Abram S. Hewitt in the management of Cooper Union, and for many years directed the Saturday Evening Free Popular Lectures on Science, etc., which constituted the beginning of what has since become a vast lecture system in the City of New York.

During the major part of this period Raymond continued to be a joint editor of the *Journal*, with Rothwell, but that arrangement between two forceful men, two men of remarkable individualism, proved gradually to be impossible. Without the least impairment of their friendship, which continued unshadowed until Rothwell's death in 1901, there were nevertheless bound to be differences regarding editorial policies. A great journal of character, tradition, and policy must necessarily be edited by one man who is solely responsible for it. Raymond tried to circumvent this by publishing on the editorial page that he was responsible only for those articles that were marked by an asterisk. Old readers of the paper will remember that custom and will also remember, no doubt, how much interest they experienced in discerning the difference in the views of the two men. But that arrangement was finally recognized to be unwise, and Raymond ceased to be an editor, appearing subsequently as "special contributor," all of his articles being thereafter signed with his name. A special contributor he continued to be until his death, though some years ago, in conformity with our policy of not publishing the names of editorial collaborators outside our immediate office, we discontinued the publishing of his name, with his own hearty approval.

In the meanwhile, Raymond's absorption in the American Institute of Mining Engineers had been steadily increasing. An original member of it, he had been vice-president in 1871, 1876, and 1877, president from 1872 to 1875, and in 1884 he became its secretary, which was equivalent to saying its administrator. Before reviewing his great work in that capacity, however, his outside work may well be mentioned, for he always had a great deal of that on hand.

From 1885 to 1889 he was one of the three New York State Commissioners of Electric Subways for the City of Brooklyn, and served as member and secretary of the board, preparing its final report, which was generally regarded as the best statement of the problem of municipal engineering and policy involved in the distribution of electric conductors. The president of one of the companies expressed a desire to honor him as "one of the first American electrical subway engineers." At the close of his official term as commissioner, he became consulting engineer to the New York & New Jersey Telephone Co., which position he retained for a great many years.

In 1898 Raymond was admitted to the bar of the Supreme Court of New York, and of the Federal District and Circuit courts, his practice being confined to cases involving either mining or patent law, in the former of which he was a leading authority. In 1903 he was lecturer on mining law at Columbia University. He delivered numerous addresses at other colleges and universities, including Yale, Cornell, Lehigh, Lafayette, Union, California, the Worcester Polytechnic, the Brooklyn Polytechnic, and the New York College of Physicians and Surgeons.

But from 1884 to 1912 Raymond's greatest work was as secretary, administrator, and editor of the American Institute of Mining Engineers. His early instincts and habits as an editor here reappeared. He regarded the Institute primarily and preëminently as an organization for the dissemination of professional knowledge. He was essentially a publicist. He stimulated contributions upon subjects that he deemed should be expounded for professional benefit; he accepted what was voluntarily offered if it measured up to his standards, and he put everything into the most beautiful, polished and lucid literary style. There are several types of editors. There is the editor who is a director of a general program, dismissing the execution of details to others. In the execution of details, especially in the handling of manuscripts, there are two methods. One is simply to scrutinize, clarify, condense perhaps, and, while correcting errors of grammar and syntax, let the author in the main express himself in his own language. Another method is to do all those things but the last, instead of which the author's expressions are polished and perhaps repolished—perhaps entirely rewritten. In technique Raymond's method was the latter. To him contributions were more or less raw material, hewed out by ax and adze. He was the joiner, carver, and polisher. The immense annual volumes of the "Transactions," for a long series of years were essentially his work, and few people appreciate the infinite pains he took with them. But let it not be thought for one moment that

his mind was concentrated upon this delicate work to the exclusion of other thoughts of major character. He would work upon nothing but good material, and he made sure of its soundness before he put his hand to it at all. His immense erudition and extraordinary memory made him a keen and profound critic, and it was not often that anything imperfect passed his sieve. Nevertheless, he was human, and consequently not infallible.

Raymond not infrequently explained this style of editing. The president of a company, observing the publication of a paper in elegant diction over the signature of one of his superintendents, whom he knew to be rather awkward, if not exactly illiterate, remarked one day:

"Raymond, why are you trying to pull wool over our eyes? Bill never wrote that paper. He couldn't if he tried."

"No," replied Raymond, "Bill did not write it, but Bill did the work that the paper told about. It was good work, and information about it is important to the industry. It is my job to present such work in a way that it may be read easily and understandingly."

This epitomizes the philosophy of Raymond's editing. It was his aim to create a refined record of progress in the arts that concerned his professional colleagues and make it something of real use to them and those who should succeed them. In carrying out this ambitious idea he added to the archives of mining and metallurgy more than any other one man, not so much by his personal contributions, although they were important, always valuable, and always highly appreciated, but as the extractor and the producer of the records, views, and opinions of other men who had done things. The profession that witnessed and valued the results had perhaps but scant appreciation of the thoughtfulness and tireless energy that drew out these contributions and smoothed them into the clear and creditable essays and monographs of which the authors have been proud.

While on the subject of Raymond's editing, let reference be made to his own literary style in technical writing. This was as nearly perfect as anything could be. He was, indeed, the supreme master of us all. In the office of the *Journal* I made one standing order respecting Raymond's MSS. If they went to the composing room at all (almost always they did), they went just as he penned them, for it was certain that none of us could improve them even to the extent of one word, and it was equally certain that there were no errors to be corrected. Nor did he often desire to see a proof, but, if he did, there were rarely any alterations that he wanted to make. The characteristics of his style were incisiveness, crystalline lucidity, and wonderful fluency. He had a marvelous gift in choosing exactly the right word, for constructing ingenious and engaging phrases, and for producing perfectly balanced sentences, while his thought was developed in a logical array of consequential paragraphs. Raymond's technical essays were as nearly technical poems as anything technical can be.

Nearly all of Raymond's contributions to the *Journal*, which continued to the year of his death, and all of his private correspondence with me, which was often voluminous, was written by his own hand. His MSS. that were rarely typed were copies rather than dictations, for he did not like to dictate. Perhaps the excellence of his literary style had some connection with this. He wrote long, intimate letters in the old-fashioned way. His penmanship was graceful, and easily legible. Interlineations and corrections were uncommon. To compositors and to proof readers his "copy" was always a joy.

After 28 years of ministry as secretary of the American Institute of Mining Engineers, Raymond, in 1912, retired with the title of emeritus. He was then over 70 years of age, and, although he was as active and vigorous as ever, he failed to become fully conscious of new aspirations and new ideas among the membership, or perhaps he entertained different opinions respecting them. There was probably some of each of these explanations of his attitude. Anyhow, he preferred to let a younger hand take the helm and to direct his attention to special work that he particularly enjoyed, performing it in his old office at the Institute without having any worry about the day's routine of office details. He was well entitled to these last years of relative ease. However, he did not, even at 70 and later, seem to be old. Indeed, he used to say, himself, that he did not grow old; that he merely grew older.

I should be a poor biographer if I tried to depict Raymond as a man free from faults and foibles. He was very human, and, also, he was of a bold and strong character. Therefore it was not unnatural that he should be steadfast in his convictions; nor was it surprising that he should be sometimes opinionated and domineering; nor that he should exhibit considerable egotism. These traits often caused his younger associates to fear lest they should offend him. However, Raymond's was too open and generous a nature to take offense over any sincere, straightforward representation, even if it were a refusal of himself. I remember very well an incident between him and me. Soon after I had become editor of the *Journal* and he had sent me his best wishes in a very warm letter, he proposed a series of articles on a certain subject, which I accepted in principle. However, when I received the MS. I was considerably exercised over his treatment of the subject and was much disturbed over how to tell him just what I thought and felt I ought to do. But I made up my mind that the only thing was to be perfectly frank, so I wrote him that I did not think it wise either for the *Journal* or for himself to publish the articles, and, in short, I rejected them. To have to reject an article by Doctor Raymond was rather an appalling thought to me in my newness in the editorial chair, and I awaited his reply with a good deal of trepidation, really expecting something tart. I was immensely relieved when he wrote me that he thought I had done right. The flow of his usual contributions on his own good subjects kept right on.

Some years later Raymond said to me one day that he had to contribute a paper to the Pan-American Scientific Congress that was to assemble in Chile, that he was very much pressed by several things, and would not I do it in his stead? I told him that I also had my hands full and could not take over that task, but I would be glad to help him all I could, whereupon he proposed a collaboration. We spent an afternoon together, mapping out the paper, and agreed upon the parts that each would undertake. Having made our

drafts, we met again and read each other's notes, after which Raymond said, "Your opening paragraph will make a good introduction" (or it may have been I who said that to him), and then we agreed that his first paragraph would appropriately fit in next, then my second and third, followed by his second, and thus we combined our productions. They dovetailed together with singular aptness, and not even was it necessary to write in more than a few connecting sentences in order to preserve the continuity of thought. Probably I am the only man who ever collaborated with Raymond in a technical paper; anyway in recent years.

But what of Raymond's professional work? Well, it was, first of all, as a publicist, as an educator, as has already been revealed in this sketch. But, besides that, he won high distinction as a professional specialist. From his early years in the field he had exhibited a predilection toward the science of economic geology, particularly ore deposits. He had early been associated with Credner (his first publication was on a geological subject), and during his commissionership he had devoted special attention to the nature and forms of mineral depositions. Along with this attraction he possessed a mind of analytical and deductive character—an essentially legal mind. The United States, in so far as its national lands were concerned, had been cursed with a singularly fatuous law governing the location of mineral claims. This law became known as the "Law of the Apex" in popular parlance, and it being soon found that Nature did not deposit valuable ores in so simple a way as the framers of the law thought, there developed litigation between claimants who held that each was entitled to the same deposit, wholly or in part. Obviously, it then became necessary to study, classify, and interpret the ore deposit, so as to ascertain whether the law did or did not apply to it, and, if it did, how, where, etc. Manifestly this required the services of mining and geological experts, and it was natural that Raymond should promptly be requisitioned. The first great case in which he appeared was the celebrated Eureka-Richmond, which is the most noted of the early cases. In summarizing what Raymond did in this case, everyone who knows will agree with the following words of William Scallon, one of his legal colleagues:

> The first great case in which he appeared was the famous Eureka-Richmond, which is also the most noted of the early reported cases. That suit involved questions of fundamental importance, the correct determination of which was vital to the successful operation of the United States Mining Statute. The decision rendered in it has been, ever since, a beacon light for lawyers and for courts. It was Judge Field who rendered the decision, but it may well be said that it was Doctor Raymond who induced it, and the great jurist himself gave credit to Doctor Raymond for his convincing exposition of the views which the Court adopted; indeed, he adopted also his very words in the statement of these views. There, Doctor Raymond successfully maintained that the law was made for the practical miner and the prospector, rather than for the geologist, and should be read in the light of practical experience and interpreted as practical mining men would understand it. The law is, even now, the occasion of so many uncertainties, that one can hardly imagine what condition would have ensued if Doctor Raymond had not, at that early day, succeeded in his advocacy of this beneficent rule. In the case referred to, it was as a witness that Doctor Raymond advanced his views; since then he has published many writings on the subject of the mining law. These have been the contributions of a publicist to the discussion of a subject of public interest. They have been no less influential in assisting and directing legal and judicial thought. Mr. Curtiss Lindley, the author of a leading textbook on mining law, has made acknowledgment, in his preface, of the great value of Doctor Raymond's discussions and writings. For myself, it is with a sense of personal obligation that I speak of these works of Doctor Raymond, for, when I took up the study of Federal mining law, there were no treatises in existence, and his illuminating writings shed a gladsome light on the intricacies of the subject. I recall with ever-increasing pleasure that I had the good fortune of professional association with Doctor Raymond in the last great underground controversy in which he appeared in court. That was at Butte. With him, too, on the same side this time, was his brilliant antagonist of the Eureka case, the learned, lovable, and dearly remembered Clarence King, as well as Mr. Brunton, and other able and distinguished men. That they won goes without saying. It is worthy of mention that, as in his first case, so in his last, the Court paid Doctor Raymond the notable compliment of quoting his felicitous language in expressing its own conclusions. Thus, we see that Doctor Raymond has been a luminary of the jurisprudence of mining, as well as of its geological and technical departments.

Raymond's brilliant exposition in the Eureka-Richmond case created a great demand for his services, and his experiences in this branch of professional work were wide and varied. Generally he was on the victorious side, which of course was not at all a matter of luck, but purely of his judgment. In one case the opposing party surrendered before trial, after a conference between its expert and Raymond, in which the latter convinced the former. On another occasion, though not at that time a member of the bar, he was invited by the U. S. Supreme Court to address it on a point in mining law; and his exposition was accepted by the court in rendering its opinion.

But Raymond was in no wise a fomenter of mining litigation. On the contrary, he was a deprecator of the absurd law that fostered it, a law that has cost this country the ransom of an empire. In an essay on "The Law of the Apex" in 1883 he exposed its stupidity and its dangers, and he made it a part of his life-work to fight for the cancellation of that part of our mining law. In this campaign he was the pioneer. The law still stands unamended upon our statute books, owing to the ignorance and sluggishness of our legislators, who have been deaf to demands for its reform; but its evil has been greatly minimized by the tacit consent of people in the mining industry to disregard it and arrange things in their own sensible way.

This sketch has dealt mainly with Raymond's professional career, his working life. It has all been "shop," so to speak. There was another side of his life that his professional colleagues did not know so well, although, of course, we heard a good deal about it and had some insights into it. But surely we did not know all the things that Doctor Hillis told in his memorial address. Raymond from his youthful days was one of Brooklyn's foremost citizens and for 60 years he was a pillar of Plymouth Church. We knew him as "Doctor Raymond." In Brooklyn he was "Ros. Raymond," or "Uncle Ros." He had early become prominent in the affairs of the church, among other things conducting its Sunday School. When Henry Ward Beecher was called away from a service one Friday evening in March, 1887, to keep an engagement elsewhere, he called Raymond to the platform to take charge, and, turning to the audience, said: "You see I leave you in good hands." This proved to be Beecher's farewell, for before the next meeting he was stricken with his last illness. In this emergency the leaders of the church turned to Raymond. Doctor Hillis told this:

> When Thomas Shearman and S. V. White and others came to see me in Chicago just 20 years ago, they said that after Mr. Beecher's death they went together to Rossiter W. Raymond and asked him to give up his work as editor, lawyer and mining engineer and take the pastorate of Plymouth Church, to whom Dr.

Raymond replied, as my old notes show, that the Providence of God, through his fathers, had lent him certain gifts ,and by His Providence guided him into an appointed path, and now that his life journey had been two-thirds fulfilled, he did not believe that the Lord was going to return to the beginning of that path and reverse Himself, and he would, therefore, follow the way appointed to the end thereof.

This report of a call of Raymond to the ministry is not so surprising a revelation of another of his many sides as some might think. Even at that time, Raymond had gone deeper into theology than most clergymen ever succeed in going. During the winter of 1885, while Mr. Beecher preached in the auditorium of Plymouth Church, Raymond lectured on the history of Israel, by Ewald, and upon Old Testament problems, as stated by Robertson Smith and Canon Driver. This was the time when the Presbyterian Church was in the throes of the heresy trial of Professor Briggs. While other churches were torn apart by the discussion of those questions, Plymouth Church went through the heated epoch without disturbance, upheaval, or fear. I am quoting Dr. Hillis.

Raymond initiated the custom 50 years ago of writing an annual Christmas story for the Sunday School of Plymouth Church, which he read about Christmas time. Never a year passed when he failed to make this contribution, which he caused to be printed as a little pamphlet for the benefit of his pupils and for his friends outside of the church circle. The latter always appreciated highly this Christmas remembrance from Raymond. His story-writing ability, which was exhibited in several novels and collections of short stories, and his poems, exemplified by his inspired ode on "The Grand Cañon," showed other facets of his many-sided ability.

Still another one was his skill as a chess player. I have mentioned already that the first time when I met him he was in the midst of a game of chess. At the dinner in honor of his 70th birthday, a silver service was presented to him. One of the pieces was engraved with the symbols of the game of chess, indicating this incidental accomplishment of Raymond's. In making the presidential address, Doctor Douglas said:

I understand that Doctor Raymond once drew a hard-fought two-hour game with Steinitz; that he holds a gold medal as the winner of a chess tourney; and some of you remember how, in 1908, a confident group of chess players on the "Campania" challenged the chess players on the "Oceanic" to a game by wireless telegraph, and got the worst of it, because Doctor Raymond directed the defense.

A complete enumeration of Doctor Raymond's writings and honors must be left for the book that will surely be written about him by someone. Enumeration would be impossible in a sketch so brief as this. Some of his more important works were the following: "Die Leibgarde" (1863), a German translation of "The Story of the Guard" by Mrs. Jessie Benton Fremont (1863); "The Children's Week" (1871); "Brave Hearts" (1873); "The Man in the Moon and Other People" (1874); "The Book of Job" (1878); "The Merry-go-Round" (1880); "Camp and Cabin" (1880); "A Glossary of Mining and Metallurgical Terms" (1881); "Memorial of Alexander L. Holley" (1883); "The Law of the Apex and Other Essays on Mining Law" (1883-95); "Two Ghosts and Other Christmas Stories" (1887); "The Life of Peter Cooper" (1897); "Christus Consolator and Other Poems" (1916); various technical works and papers on mining law, as well as numerous addresses and magazine articles, and contributions to several American dictionaries and encyclopedias.

Throughout Raymond's distinguished career honors were showered upon him. He was made an honorary member of the American Philosophical Society, the Society of Civil Engineers of France, the Iron and Steel Institute, the Canadian Mining Institute, the Mining Society of Nova Scotia, and the Institution of Mining and Metallurgy of Great Britain, and numerous other technical and scientific organizations both at home and abroad. He received the degree of Ph.D. from Lafayette College in 1868, and that of LL.D. from Lehigh University in 1906. On the latter occasion, speaking as an adopted alumnus of the university, he delivered to the graduating classes an address on "Professional Ethics" which has been widely quoted and approved. In 1908 the Institution of Mining and Metallurgy awarded to him its gold medal.

In 1911, during the visit to Japan of a party of members and guests of the American Institute of Mining Engineers, Raymond received from the Mikado the distinction of Chevalier of the Order of the Rising Sun, fourth class, the highest ever given to foreigners not of royal blood, "for eminent services to the mining industry of Japan." These services consisted in advice and assistance rendered in America to Japanese engineers, students, and officials throughout a period of more than 25 years. In February, 1915, Raymond delivered the commemorative address on the 150th anniversary of the foundation of the University of Pittsburgh, and received its honorary degree of LL.D.

Raymond died very suddenly on the afternoon of the last day of 1918. He had been ailing a little for a few days previously, but the trouble did not seem to be of much consequence. On the previous Sunday morning he had read his fiftieth annual Christmas story in the Bible School of Plymouth Church, and on the previous Friday evening he had made a long address on the spiritual influences of the Great War. Doctor Hillis had asked him to speak on the forgiveness of enemies national. He began his address by saying that he much preferred to speak upon another theme, particularly because he found himself in full sympathy with the imprecatory psalms, and that as far as the forgiveness of our enemies who had butchered Belgium were concerned, there were moments when he understood how the chief of a cannibal tribe in the South Sea Islands felt. Asked by the missionary whether or not he was willing to forgive his enemies, the chief answered: "Certainly, certainly. Last week I ate them all up." "Then Doctor Raymond delivered one of the most brilliant addresses on what this war has done to the soul of the American people to which any of us had ever listened," said Doctor Hillis. "Never was he in finer form. Notwithstanding his nine and seventy years, his mind glowed and sparkled through 40 minutes. Never did he seem more lovable, more gentle. There was in his carriage always a certain note of chivalry. He seemed a Twentieth Century embodiment of the Knight Errants of Sir Thomas Mallory. Those of you who recall his youth think of him as a kind of Sir Galahad, and those who remember his age think of him as Sir Percival, who saw the Holy Grail because his heart was pure."

Raymond felt very deeply regarding the holiness of the cause of the Allies in the war, as readers of the *Journal* know from some of his contributions this year and last. I am reproducing his last contribution, which we published Sept. 14, 1918. When he sent it to me he suggested that it might not be suitable for an engineering paper. I replied that anything that helped the great cause was suitable for any kind of a paper, and this, his last contribution, well illustrates his wit:

To engineers especially, the explanations offered by the German staff and the German press, to account for the successive defeats of the German army, are peculiarly amusing. The other day, we were told that Ludendorff had shown masterly ability in throwing enormous reserves into the Marne salient, so as to facilitate the retreat of the force already there—which reminds me of the story of the Irishman who was seen punching a greenback down between the boards of the Atlantic City boardwalk. His explanation was that he was not wasting the greenback at all—he had lost a nickel in that crack, and he was simply putting enough after it to make it worth his while to take up the planks.

But the latest of these amusing *camouflages* is the pæan of triumph over "our victorious retreat," of which the following verses may perhaps be regarded as a sufficiently accurate echo:

AN INTERVIEW

"Wilhelm, what blacked your eagle eye?"
"O curious journalist!
It was this eye, now swollen high,
That smote old Foch's fist!"

"And, Wilhelm, 'seems to me you limp
And stumble as you go."
"'Tis true, I gave my leg a crimp
In stamping on the foe."

"O Wilhelm! whence, for goodness' sake,
That footprint on your seat?"
"That's where he failed to overtake
My masterly retreat!

"For I, when he came on apace,
With frenzy born of fear,
Strategically saved my face
Behind my conquering rear.

"Yes, even in battle's dread array
The leader still I'll be;
To hostile hosts I'll show the way,
And they shall follow me!

"Now let those brazen bands of mine
Strike up the usual tunes,
Beginning with *Die Wacht am Rhein,*
And ending, *Gott mit Uns!*"

Five or six years ago I began to tease Raymond to write his personal reminiscences, especially of the period from 1865 to 1880, and Arthur Dwight joined me in trying to persuade him to do so; but we did not succeed, although I am sure that we tempted him strongly. However, he had his heart set upon writing a history of the Institute (which perhaps might have come more or less to the same thing) and he wanted to devote his remaining years to that. We do not know how far along he got with it. One of the most beautiful things about Raymond's life was his devotion to his wife, whom he married in 1863, she being a daughter of William and Mary Dwight, of Brooklyn. In recent years, Mrs. Raymond's eyesight failed, and, to entertain her, the Doctor read to her a great deal and let his own interests go.

The American mining industry has lost during the last year three great men—Eilers, Douglas, and, lastly, Raymond. They were contemporaries, born at about the same time and dying within a narrow space. All three attained ripe years, and together they did more for our mining and metallurgy than any other three men. The association between Raymond and Eilers was one of beautiful, lifelong friendship. Eilers was born a year earlier and died a year earlier. He joined Raymond as an assistant about 1866, and continued with him through the years of the commissionship. Thereafter, when Eilers took up his residence in the West, his hospitable roof was always a home for Raymond, and, as the latter said, after more than half a century he could not recall a single occasion of even temporary and passing discord to mar that perfect friendship.

Raymond was one of the most remarkable cases of versatility that this country has ever known. Sailor, soldier, engineer, lawyer, orator, editor, novelist, story-teller, poet, Biblical critic, theologian, teacher, chess-player—he was superior in each capacity. In some he was superlative. In none was he mediocre. It was given to him to possess supreme powers in two ways—as a publicist and as a professional specialist. Almost any man deems himself distinguished if that can be said of him in one thing. Yet according to Raymond's own view he had not done the things he intended to do, but rather had unconsciously obeyed the maxim of Browning to "Get thy tools ready; God will find thee work." Rather than to work of creative and constructive leadership, Raymond, in his own words, gave his life and his strength to the vocation of an interpreter, chronicler, guide, and assistant to engineers. That is, I think, an approximate, but not an absolute, summary of his professional work. But even if there were no more, is not his own modest estimate enough to be satisfying? Raymond exalted his philosophy and his religion in these splendid words that he spoke at Eilers' funeral:

And yet—and yet—can this be the end? Love says, No! and Science says, No! For the very existence of science demands the assumption of a rational universe. Nature must not tell us lies. Her evidence must be interpretable. And science, starting on that basis of faith in honest evidence, has discovered not only order but purpose in the evolution of the universe. We can read the progress of that purpose in ages past, from primordial slime through the ascending forms of life, to savage man, barbaric man, civilized man—through specific features to personality. Science confirms the poet who says, "An honest man's the noblest work of God." And science cannot receive with respect the conception of a Being who would spend aeons in careful, patient preparation to bring forth a man only to destroy him—a God blowing bubbles, and, just when such a radiant sphere has reached its brightest rainbow glory, dashing it into mist, in order to begin another with futile inflation. How childish, how absurd! No; we demand a reasonable universe and a respectable God—we students of science. We will not accept the notion that earthly death ends all. It is too ridiculous!

And as Raymond said to Eilers' spirit not farewell, but *a rivederci*, so said many friends over his own outworn body.

Nevada Wonder Mining Co.

The eleventh annual report of the Nevada Wonder Mining Co., operating at Wonder, Churchill Co., Nev., covering the year ended Dec. 31, 1917, shows that the development work done consisted of a total of 10,916 ft., a monthly average of 909 ft. The recovery of gold was 7512 oz., and of silver, 816,852 oz., from 55,800 tons of ore, carrying 0.141 oz. gold, and 16.65 oz. silver per ton. This indicates a recovery of 95.32% of the gold and 87.90% of the silver. The decrease in the recovery of silver was caused by a change, from the readily soluble silver minerals, in the ore found at depth in the mine. Four Senn concentrators are being installed and will be ready for service on Jan. 15, 1918.

Dividend disbursements during the period under review amounted to $281,694.80.

Dredging in 1918

GOLD dredging was seriously retarded in 1918 by the same conditions that impeded operations in vein and lode mining of gold ore. Indeed, the dredging industry, because of the very narrow margin of profit under normal conditions, has generally been placed in a worse position than has vein mining. When the complete reports for 1918 are available, few dredges will show any considerable profit. Most of them will show that they have been patriotically getting out every ounce of gold that they could while keeping their plants in good order and their well-trained crews together, hoping that relief might come from some source before the ground was all worked out. In most cases it has been more the hope of more favorable operating condition than patriotism that has kept the dredges working. Their operators have been between the devil and the deep sea. Continuance of operations meant production at a loss or with no profit. Cessation of operations meant deterioration of plant. So they faced loss in either direction. Yukon Gold passed its dividend, and others must defer dividend disbursements if they have not done so already.

Owing to the disadvantageous position held by gold dredging, little new work was started in 1918. In Alaska the Yukon Gold Co. continued its operations, but in a somewhat restricted manner, because of the shortage of labor and the high cost of supplies. The Canadian Klondike Co.'s dredges operated throughout the year, but the value of the ground worked was so low that, in spite of the employment of every possible economy, little profit resulted from the year's operation. No new work of any moment has been undertaken at Nome, and the reports so far received from this section concerning the year's operations are discouraging.

Few new boats have been put in commission in the California field, and several have almost finished the acreage on which they had been working. Under normal conditions such dredges would be ready to be dismantled and moved to new fields, but the present heavy cost of moving and rebuilding does not make this an attractive venture. The matter of resoiling has continued to occupy the attention of California operators, but successful resoiling, if it can ever be a success, requires rearrangement or practically rebuilding of the disposal end of the dredge, and the value of the redeemed land is usually too low to warrant the expense. When working deep ground, it is practically impossible to resoil, but when not digging more than 10 or 12 ft. some measure of success is possible.

Gold dredging in the Philippines has encountered setbacks, due to the fact that the Gumaos dredge, after five years' successful operation, had worked out all of its ground, and in attempting to move it some distance to a new piece of ground the dredge was wrecked and sank. The Mambulao dredge, which was put in operation two years ago, has also been unfortunate. Soon after beginning operation this dredge ran out of pay ground, and while attempting to move it to a new location it was overtaken by a typhoon and was sunk. However, it is expected that the dredge will be raised and put in operation again in the near future. Meantime, no new work has been undertaken in the Philippine Islands, and it will probably be some time before local capital can be induced to undertake new operations.

No new work has been undertaken in Colombia, and the one dredge that was shipped down in 1917 for the Lewisohn interests has not been completed, though their other dredge operated more or less during 1918 and recovered remarkable quantities of platinum. Colombia produced approximately 20,000 oz. of platinum in 1918, but most of this came from the small native hand workings in the various fields along the west coast. While speaking of dredging in Colombia it should be mentioned that this field has not been completely explored. There are extensive areas of possible ground tributary to the Magdalena River, and others are accessible from the west coast. Much of this ground is low and unhealthful, but as time passes more is being learned in respect to keeping a crew in health while working under tropical conditions. Transportation facilities show evidences of improving, and it is by no means impossible that future undertakings in Colombia may equal the highly satisfactory results of the Pato dredges.

Foreign Dredging Fields

No new installations have been undertaken in Russia, but at some points the older dredges have been kept in operation, notably the Orsk Goldfields Co.'s dredge on the Kolchan, which has operated continuously without interference from local governmental disturbances.

Korea opens up promising fields, and it was hoped that some further exploration work would be undertaken in that country in 1918, but little has been done along these lines so far. In the meantime, the Chiksan Mining Co.'s dredge in Korea, which was started up about a year ago, continued in successful operation throughout 1918.

In the Malay field, profits resulting from the operations of the tin dredges have been large, though the dredges have been rather crude affairs. This field offers interesting opportunities for dredge-constructing engineers backed by American capital.

The successful results of several dredging operations begun ten years or more ago have encouraged thorough prospecting of many widely scattered areas throughout the United States, but little promising ground, apparently, remains to be drilled, and scarcely any new areas were explored seriously in 1918. There are apparently greater opportunities for this work abroad than at home, and in the future, when dredging costs have returned to a pre-war basis, capital will undoubtedly be prepared to investigate foreign fields.

A review of the year's work in dredging would not be complete without mention of the publication of Bulletin 127 of the Bureau of Mines, "Gold Dredging in the United States," by Charles Janin. This paper discusses most lucidly the history, costs, and, in short, the whole field of dredging for precious metals, and the subjects are treated in a manner that should be of the greatest benefit to operators and engineers, bringing the subject up to the end of 1917, since which time little of importance with respect to dredging for gold has been brought to public notice.

Chrome Mining in Canada

BY ROBERT HARVIE*

THE year 1918 was the most successful in the history of chrome mining in Canada, the production coming mainly from the Black Lake and Richmond districts of Quebec Province, with a few hundred tons from British Columbia, which for the first time figures in the returns. The shipments, based on the returns for 11 months, will total 21,200 short tons, valued at $800,000, and consist of 6100 tons of concentrates, averaging 50%, and 15,100 tons of crude ore, averaging 36%. With the exception of about 2000 tons, the output was sold in the United States. Prices f.o.b. Black Lake, for short tons, ranged from $19 to $30 for 30%, from $25 to $43 for 40%, and from $45 to $80 for 50% ore.

From 1894 to 1908 a steady production was made by the Black Lake district, and from 1903 to 1907 it was sufficiently great to give Canada either third or fourth place among the world's producers of chromite. In 1909 production declined to zero, owing to the impossibility of meeting the competition from the larger, richer deposits in Rhodesia and New Caledonia. There was no production from 1909 to 1914. In 1915 the rising freight rates on ocean shipments of chrome ore reached such a level that the correspondingly rising prices offered for chrome ore attained a figure at which Canadian deposits could once more be profitably worked. The following table indicates the renewal of activity in what had been a dormant industry in Canada. Incidentally, the figures admirably illustrate the influence of increased prices in bringing out supplies and stimulating production.

CANADIAN CHROME SHIPMENTS, 1914–1918

	Short Tons	Total Value	Average Value per Ton
Total prior to 1914	62,334	$716,400	$11.29
From old stocks, 1914	136	1,210	8.90
Shipments for 1915	12,341	179,543	14.55
Shipments for 1916	15,412	312,901	20.35
Shipments for 1917	23,327	572,115	24.50
Shipments for 1918(a)	21,200	800,000	38.00

(a) Estimate based on shipments for 11 months.

As compared with the monthly average of 1917, the first quarter of 1918 showed a distinct decrease in production in what should have been months of high production. The reason for this was an unduly conservative attitude on the part of the producers, who apparently could not believe that the exceptionally high prices of 1917 would last.

In March, 1918, at the request of the United States Government, the Canadian War Trade Board undertook to stimulate the production of chrome to meet an anticipated shortage due to restrictions then being placed on imports. I was already in charge of the work of the Geological Survey of Canada in the Black Lake district, and was appointed representative of the War Trade Board. The policy of this board has been to work in coöperation with the producers, and to improve existing facilities rather than overturn them, and direct assistance has been given in many ways. The speedy granting of export and import licenses on machinery and supplies, the waiving of express regulations to facilitate delivery of machinery, obtaining military exemptions for skilled employees, improvement of freight-car service, the securing of timber-cutting privileges, and an arrangement whereby the value of machinery was decided by arbitration were a few of the conditions secured by this coöperation.

During the second and third quarters, production improved, and an increase of about 25% over the corresponding period of the previous year was obtained. In September, however, the falling demand for chrome in the United States began to take effect on production, and during October and November the influenza epidemic, as well as unusually bad weather conditions, caused a drop in the production. This decline toward the end of the year is responsible for the total yearly tonnage being slightly less than for 1917.

No new deposits were discovered in 1918, but those producers who showed any energy in development were rewarded by large additions to their ore reserves. The most noteworthy deposit being operated is that crossing the Belanger-Mutual Chemical lots, from which the greatest production of chrome units during 1918 was made. This may be described as a zone or zones of disseminated ore, worked for 1400 ft. in length and to a depth of 100 ft. Besides the main zone, bodies of ore are found to either side, from one of which crude ore assaying more than 52% may be produced. One pit measuring roughly 50 ft. x 100 ft. is mining decomposed ore of good milling grade by merely pick and shovel. The Mutual Chemical Co. is opening its portion of the deposit by a shaft now sunk over 100 ft., with a first level at 90 ft. already in operation. Both the Belanger and Mutual Chemical mills were operated full time.

The Quebec Asbestos and Chrome Co., at Saint Cyr, near Richmond, operated to capacity during the year, and installed a 100-ton mill, as well as beginning underground operations. At one 200 ft. shaft over 500 ft. of drifting and crosscutting has been done on two levels. A second shaft is being sunk to a depth of 100 ft. The progressive policy which in 1917, the first year of operation, made this property the largest producer of chrome units for that year, is being continued with satisfactory results.

The property of the Black Lake Asbestos and Chrome Co. was worked in 1918 chiefly by small contractors, but in September a three-compartment shaft was started at the Caribou pit on company account. This property, which includes a great acreage of chrome-bearing lands and which during the former activity was the largest producer, has been robbed to the point of embarrassing future operations.

Although the Quebec operations were hard hit by the unexpected turn in the chrome situation in the latter part of 1918, it is probable that the above-named properties and mills can continue to be operated at a profit at even lower than the present prices. The mills have been built, and are probably already paid for out of profits, so that concentrates can now be produced without heavy charge for capital account. During early December, when all the mills were working full time, the output of concentrates was 60 tons per 24 hours, and it is thought that this rate can be maintained.

*Geological Survey, Ottawa, Canada.

The Miami District, Oklahoma

BY A. E. BENDELARI*

The Miami district includes the following camps: Commerce, Tar River, Century, Picher, Quapaw, Lincolnville, St. Louis, and Hockerville (all in Oklahoma); and Treece and Monarch (in Kansas, and for a distance of two miles north of the Oklahoma line into Kansas, and six miles east to Baxter Springs). The area is about twelve by six miles, and it now contains over 150 concentrating plants, varying in capacity from 150 to 700 tons per 10-hour day. In the newer fields a number of prospecting drill rigs are in operation.

All this activity has arisen during the last four years. In fact, it is just three years since the first mills were built in Picher and Tar River. The pioneer operators had to go back and forth as best they could through mud that was almost impassable, and machinery had to be hauled across the prairies, but now these mines are served by two railroads, and an interurban system gives the town of Picher, which is the hub of the district, a half-hourly service to Joplin.

During the year 1918, the total production of zinc concentrates from the Oklahoma-Kansas district was 523,514,000 lb., valued at $13,974,906, and 99,146,000 lb. of lead concentrates, valued at $4,595,500; making a total of $18,570,406, which is a wonderful showing, considering the time the field has been in operation.

The total represents the output of many individual operations; however, the greater portion of the production was made by the larger companies whose names are given in the table.

LARGE OPERATING COMPANIES IN THE MIAMI DISTRICT

	Mills
Commerce Mining and Royalty Co	8
Eagle-Picher Lead Co	8
Skelton Mining Co	6
Admiralty Zinc Co	6
Golden Rod M. & S. Co	6
The Lucky Companies	5
Bilharz Mining Co	4
Underwriters' Land Co	3
The U. S. Smelting Co	3
St. Louis S. & R. Co	2
Anna Beaver Mining Co	2

The price of the average grades of zinc ore for the year was unsatisfactory to the operators, whose production was based on war-time costs of labor and supplies. The price varied from $40, which was the bottom reached several times during 1918, to $57.50 per ton. Lead, however, was steady during the first six months of 1918, averaging $85 per ton. During the latter six months the price remained at $100 until early in December, when it dropped to $80.

The producers of high-grade zinc ore, which carried less than 0.20% lead, were more fortunate, and, through an agreement with the zinc smelters who make sheets, and with the approval of Washington, enjoyed a price of $75 per ton for the larger part of the year. Many producers were able to make part of their production high-grade, and received a weekly allocation, which helped the average selling price. In other cases, those who were not able to make the high-grade had a good percentage of lead, and were able to get the benefit of the high lead price. In this way they brought up the average selling price for their concentrates.

Reference made to Kansas relates to the new field adjacent to the Oklahoma line, the western end of which is three miles west of Picher. There are now about 15 mills in this vicinity, and, although the field is new, the orebodies already opened up seem to be especially rich and have indications of being extensive.

Farther east, toward Baxter Springs, the Chanute Spelter Co., a subsidiary of the American Metal Co., has a large acreage under lease, and a number of prospecting drills in operation. The finding of a number of extensive orebodies is reported, and one mill is already built, and, when the shafts are completed, will begin operation. Heavy water flows have delayed the work, but three Pomona pumps operating in 16-in. drill holes are now draining the ground.

In pre-war times the cost of mining and milling a ton of rock in the old Joplin-Webb City district was figured roughly at $1. For the last three years this has increased gradually, until there are few companies at present in either the Joplin or the Oklahoma-Kansas field which can produce for less than $2, and the average is probably higher. This has worked a great hardship on the old district, where the recoveries were small, and a number of mills that made the Joplin and Webb City district famous have been moved to Oklahoma, where the orebodies are richer.

As this district reached the producing stage since the beginning of the war, in 1914, one can but forecast its future when conditions become normal. With such demonstrated ore deposits as the district possesses, especially in the deeper levels, where they are very uniform, there can be no doubt, on account of the large mineralized area, that it will continue to be a heavy producer for years.

*Manager of mines, Eagle-Picher Lead Co., Picher, Oklahoma.

Quicksilver in Texas in 1918

BY W. D. BURCHAM*

During 1918 quicksilver was produced in Texas by the same properties as in the previous year—the Chisos, Mariposa, and Big Bend mines in the Terlingua district, and the Ellis mine, about 40 miles further east. At this last-named mine the ore is treated in retorts designed by the mine superintendent. The retorts are placed on an incline, the ore moving through by gravity. At the other mines the metal has all been extracted by means of Scott furnaces, ranging in capacity from 10 to 50 tons.

The Mariposa mine, which at one time was one of the largest producers in the country, is unique among the mines of Texas in that practically its entire production has been obtained from the surface. The ore occurs in numerous outcropping fissure veins over a wide area. The present management is mining ores considered too low in grade by the original operators in the days of low prices. Prospecting at depth is being carried on. This mine, at the western end of the district, lies in formations that are 700 ft. deep at the Chisos mine, six miles further east, and supposedly about 1300 ft. deep at the Big Bend and Texas Almaden mines, six miles still further east at Study Butte, which is the eastern end of the district so far as developed.

The Texas Almaden is not producing, but both it and the Big Bend mine are being unwatered by joint operations between the lessees of the Texas Almaden Mining Co. and the Study Butte Mining Co., lessees of the Big

*Manager, Study Butte Mining Co., Terlingua, Texas.

Bend. These mines have a 50- and a 20-ton furnace, respectively. The ores occur in a series of fissures filled with calcite and cinnabar, and occasional impregnations in an intrusion of rhyolite. The intrusion is 500 ft. thick; it is flat lying and covered by 50 ft. of limestone shale, except at the southern extremity, where it turns sharply upward, extending 250 ft above the surface and making the Study Butte.

The only active prospect in the district is the property of the Rainbow Mining Co., adjacent to the Chisos mine. The company is sinking a shaft, which is to reach a depth of several hundred feet, before driving a crosscut toward a fault where ore is expected.

Although the price of quicksilver was uniformly high in 1918, on account of the demands caused by war uses, the production of the state fell off to less than two-thirds of the amount produced in 1917. This was due to the fact that quicksilver deposits are erratic, and each foot of stoping area necessitates a greater footage of development than probably any other kind of ore mined. The certainty of the present and the uncertainty of the future have caused the mine owners to concentrate their efforts for the last two years on mining the available ore and leaving much of the development and prospecting until such a time as there would be a reasonable expectancy of future prices that would justify the costs.

The mines of Spain, with ores averaging from 8 to 15% mercury, can produce and deliver quicksilver in New York for $35 per flask. This competition is entirely too severe for the American quicksilver miners, whose ores seldom run over one-half of 1% and whose costs of production amount to about $75 per flask. A conference between the United States Tariff Commission and the producers of quicksilver was held in San Francisco in June. It was the consensus of opinion that an import duty of $35 per flask, in addition to the present *ad valorem*, would be necessary to keep the mines operating after the coming of peace. Although vital in time of war, the industry is so small that there is apprehension that it will be entirely overlooked by the Government, and will therefore die a natural death. With such a duty, there is no doubt that the mines of Texas could produce for a number of years.

The principal peace uses of quicksilver are in the drug trade and in the manufacture of paint and ammunition. In war time it is an essential constituent of the fulminate used in detonators. For this purpose there is no satisfactory substitute, and although all hope and expect that the world has seen its last war, the fact still remains that, if the United States should have a war with a nation that could blockade American ports, the country would be at the mercy of its enemies if American quicksilver mines were closed. It would take a year or more to reopen the mines and do the necessary development for production.

Petroleum in California

The total production of petroleum in California in 1918, according to an estimate by the California State Mining Bureau, amounted to 100,000,000 bbl. This is in excess of the figures for any year except 1914. The total value of the 1918 production was about $123,000,000. Figures in the possession of the bureau show that during the last four years the acreage of proved oil lands has increased 20%, and now amounts to 87,280 acres. The number of producing wells increased in the same period by 10%. It is therefore obvious that a large margin of land remains undrilled. During the last nine years the total market value of oil at the well has amounted to $436,474,667. Dividends paid by producing and marketing concerns totaled $177,046,572.

The total capitalization of all refining and producing oil companies considered, numbering 294, is $292,314,595, and the dividends in 1917 were at the rate of 16.9%. The capitalization of the smaller producing companies is $123,433,008, and the 1917 dividend rate was 6.9%. The added profits attending marketing and refining are therefore considerable. The smaller companies which merely produce oil and sell it in a crude state, at the wells, have paid $48,309,177 in dividends since 1909, which is about 27% of the total dividends. These smaller companies at present produce about 28% of the total oil, and own or control about 35% of the proved acreage.

OWNERSHIP OF OIL LANDS IN CALIFORNIA

Operator	Per Cent. of Total Oil	Proved Land Acres	Number of Wells
Associated Oil Co.	9.1	7,347	1,048
Doheny (various companies)	7.3	4,286	379
General Petroleum Corp.	4.3	2,584	400
Honolulu Cons. Oil Co.	1.3	2,701	35
Atchison, Topeka & Santa Fe Ry. (oil subsidiaries)	4.0	3,097	412
Shell Co. of California	6.8	2,442	236
Southern Pacific Co. (Fuel Oil Dept.)	8.5	18,267	681
Standard Oil Co.	22.6	8,187	771
Union Oil Co. of California	8.1	8,198	427
All others	28.0	30,171	3381
Totals	100.0	87,280	7,770

Although it is true that the large companies are constantly enlarging their holdings by purchase from smaller concerns, there has also been a constant increase in the number of small companies paying dividends. In 1909 there were 65 such companies, and in 1917, 129. The average price of crude oil bears a fairly constant relation to the amounts paid out as dividends. From 1909 until 1917, inclusive, the average value of crude oil was slightly over 55c. per barrel, and the total dividends have averaged about 22c. per bbl. of total production. Prices have fluctuated throughout that period between the limits of 48c. and 91c., but the total dividends have, each year, been at a rate of about 33c. per barrel less than the average market price.

Comparison of the present ownership of proved oil lands in California with that of four years ago still shows that there is no monopoly, although 65% of the lands are held by only nine companies, and 72% of the oil is produced by them. The land ownership and percentage of the total oil production by the larger concerns is shown in the accompanying table.

The Skoda Works—The great Skoda armament works, of Pilsen, in Bohemia, have been the chief prop of the Austrian munition industry throughout the war, although the proprietors are of Czech origin. One of the first acts of the government of the new Bohemian Republic, says the *Ironmonger*, was to call before it Baron Skoda and some of his fellow directors and read the riot act to them. The baron was told that his action had been unpatriotic and that he must immediately come to terms with his Czech workmen. He appears to have promised to do anything that was asked of him, if only his property rights were guaranteed. Whereupon the Czechs told him to dismiss his German employees and to adopt the eight-hour day, raise wages, and introduce other reforms.

Graphite in 1918

DOMESTIC shipments of crystalline graphite of the grades known as No. 1 and No. 2 flake for the first nine months of 1918, according to the U. S. Geological Survey, were 3388 tons, the greater portion coming from Alabama and the remainder from New York and Pennsylvania, although small quantities came form California, Montana, and Texas. Shipment of these grades in 1917 totaled 3408 tons. The demand for domestic flake graphite early in 1918 was slight, owing to large stocks of the imported product and a decrease in the production of crucibles. Prices were lower than in 1917, and No. 1 domestic flake, with a carbon content of 90% or more, sold at 16@17c. per lb., f.o.b. mines, as against 17@19c. in 1917. Toward the latter part of 1918 there was a good demand for No. 1 flake of 85% carbon, which sold at about 15c. per lb. f.o.b. mines. The demand for 90% grade was not so good, but prices ranged up to 20c. per lb. Production of amorphous graphite, which has come principally from Rhode Island, has averaged about 5000 tons for the last three years. According to the Department of Commerce, imports of graphite for the first 10 months of 1918 totaled 18,062 tons and were valued at $2,988,295, and for the same period in 1917 they were 33,831, valued at $7,853,331.

Position of Domestic Flake in Crucible Manufacture

American consumers of crucible graphite, with one exception, maintain that American flake will not make a good crucible of itself, not having the proper physical formation, and that 25 to 30% of it is all that can be successfully used in mixture with the Ceylon product. The Bureau of Mines has been conducting a series of parallel tests with American and foreign graphites at the Ohio State University laboratories at Columbus, under the direction of R. S. Stull, to determine definitely how a crucible made of 100% American flake will compare with the crucible made from the foreign product.

Following a meeting of graphite producers, consumers, and importers with the Shipping Board at Washington in March, it was decided to stop imports of Ceylon graphite until July 1, after which time shipments would be restricted to 5000 tons for the remainder of the year. However, this allowance was exhausted previous to November, and since then certain importations have been allowed under permit.

Alabama Graphite Production

According to W. F. Prouty, who will review Alabama graphite in a subsequent issue, 30 plants were in operation in December, 1918. A schedule of prices, suggested by the Graphite Producers' Association, was approved by the Government, although no prices were fixed. These prices ranged from 20c. per lb. for No. 1 flake, containing 90% of carbon, to 10c. per lb. for No. 2, 80% carbon flake. Prices for graphite dust ranged from 1c. for 25@30% carbon to 12c. for 85@90% carbon. The production of flake graphite in Alabama in 1918 was about equal to that of 1917, though that of the lower grades of so-called dust graphite was less. The total production in 1917[1] was 6,223,095 pounds.

[1] "Mineral Resources of the United States," 1917.

Through interviews and correspondence between the Graphite Producers' Association of Alabama and the different war boards, the Alabama producer was urged to develop, expand, and increase graphite production, and, to support this encouragement, an embargo was actually placed on foreign importation, and domestic consumers were ordered to use not less than 20% of domestic flake (which is to be interpreted as also including Canadian flake) in their crucible mixtures. But this did not produce a satisfactory demand for Alabama flake or a price in keeping with increased costs of production, which were from 60 to 65% above those of 1917.

Improvement in Ore-Treatment Methods

There was a marked development in ore-treatment processes in 1918, and this would have been greater under more encouraging market and price conditions. The efforts of the Graphite Producers' Association of Alabama were strongly in the direction of improved methods of milling, with a view to higher recovery and lower costs of production, as well as toward the standardization of product. Experiments leading to several installations have been worked out with the Callow and Minerals Separation systems, as well as with classifiers and tables and the old-fashioned log washers with modifications. A number of new veins were opened in Alabama during 1918, showing, for the most part, good ore.

Three Producers in Adirondack District

The New York graphite industry was secondary to that of Alabama in the United States in 1918. According to D. H. Newland, who prepared a paper on New York graphite which appears in this issue, the actual production fell short of 5,000,000 lb., although considerable work was done in the enlargement and improvement of plants. There were three active producers in the Adirondack district, and some work was done by the Flake Graphite Co., near Saratoga Springs. The demand was steady, and good prices prevailed. At the mills there was a substitution of wet tables or dry jigs for the buddles that have been the standard for some time, and flotation was used to some extent, although this latter is only in the experimental stage as regards graphite treatment.

Pennsylvania graphite production in 1918 was active, and amounted to approximately 450 tons, according to the Geologic Survey of Pennsylvania. The deposits in Pennsylvania do not extend over as large an area as those of Alabama, but the rock quarried contains a higher percentage of graphite and the size of the finished flake is larger. The largest deposits are found in the valley of Pickering Creek, Chester County, and the operating companies form two groups, which are designated according to district—Byers or Chester Springs.

New Milling Plant in Ontario

Ontario refined graphite production in 1918 was 3022 tons, as compared with 3173 tons in 1917. There were three operating companies, according to Thomas W. Gibson, who will review Ontario graphite in a subsequent issue, two concerns, the Black Donald Graphite Co., at Calabogie, and the Globe Graphite Mining and Refining Co., at Fort Elmsley, being old producers, and

the Timmins Graphite Co. in North Burgess Township. At the latter, the vein has been stripped for some distance and the company is building a 200-ton mill, which will be placed in operation early in 1919. Flake graphite ranged in price from $140 to $320 per short ton, with little demand, and plumbago sold from $45 to $80 per ton, with an active demand until November.

Ceylon Industry Dull in 1918

During 1918, the graphite industry in Ceylon experienced a period of stagnation, according to Consul Walter A. Leonard. The chief reason for this was the decrease in the shipments to the United States, which was due not only to the War Trade Board's restriction on imports but to a lessened demand for the imported material. In 1917, the United States took over 81% of Ceylon's product, which amounted to 24,575 tons, with the best grades selling as high as $500 per ton, and in 1918 the amount and the prices were less than half. It is stated that with improved machinery for working at greater depths, Ceylon graphites can be mined at the rate of 30,000 tons a year. Ceylon graphite or plumbago is of the purest quality and is preferred by the crucible makers. According to Charles E. Pettinos, average prices for first quality Ceylon graphite have been as follows: During normal times, before the war, lump, 10c. per lb.; chip, 6c., and dust, 4c.; highest price during the war (which covers the period late in 1916 and early in 1917), lump, 30c.; chip, 22c. and dust 14c. Today lump sells at 18c., chip at 14c., and dust at 11c. per lb., f.o.b., New York. These prices include excess freight charges and war-risk insurance. The three grades of Ceylon graphite (lump, chip, and dust) contain, respectively, 90%, 80%, and 70% carbon content.

The production of flake graphite in Madagascar in 1917 was about 35,000 tons, of which 27,838 tons was exported to England and France, according to Consul James G. Carter. Early in 1918 prices slumped and dropped from about $140 to $96.50 per ton for flake graphite averaging 90% carbon. During the second quarter, importations from Madagascar to France were prohibited, and, later, shipments to the United States were forbidden, but this embargo was raised by the French government on December 28.

Graphite Mining in New York State

By D. H. Newland*

The Adirondack graphite industry exhibited some progress during 1918, but the district can hardly be compared in that respect with Alabama. The latter experienced a remarkable development under the stimulus of war conditions, and now has outdistanced the older field as a mining center. Operations were maintained throughout 1918 at three New York graphite mines, all of which were active in 1917. These included the American mine at Graphite (one of the holdings of the Joseph Dixon Crucible Co.), the Hooper Brothers' mine at Whitehall, and the mine of the Graphite Products Corporation at Saratoga Springs. Some work was performed by the Flake Graphite Co., the only other enterprise that was equipped for operation, with a mine and mill situated in the town of Greenfield, west of Saratoga Springs. No new projects were under development that may be expected to start production within the current season, although some interest has been shown in a number of other properties, including the Faxon, which adjoins the American mine; the Bly property, west of Ticonderoga, and the Smith prospect, which lies in the extreme northern part of Essex County.

With an estimated production of about 5,000,000 lb. of concentrates, the actual output was somewhat below that figure. Each of the operative companies carried out improvements and enlargements of installation that interfered with the normal running of the plants. Market conditions were practically on the same basis as in 1917, and a steady demand for the output and good prices obtained under the influence of the restrictions put upon importations. It would be difficult to give average figures of sales, as they varied for each mine according to size and purity of the products, in which respect there was some variation also between one shipment and another from the same mine. The mill concentrates comprised three grades, No. 1 flake, with 86-90% carbon; No. 2 flake, of finer size and with about 80% carbon; and dust containing 40-45% carbon. The last grade is practically a waste product for mines not equipped to put products in final finished forms.

In a technical way, the main event of 1918 in respect to the New York graphite industry was with regard to mill treatment—the final discarding of buddles as the one universal apparatus for separation of the graphite. Although the buddles were supplemented at some of the mills by wet tables or dry jigs, they had come to be regarded as indispensable for the bulk treatment of the ore and usually took the whole flow of the mill. Flotation was adopted as a substitute, but just how successful this process proved I am unable to state, as sufficient work has not been done as yet to afford the basis for an accurate estimate. There seems to be confidence among the operators that flotation represents an advance over the buddle in saving more of the graphite for the higher grades and in costs of operation. The loss of about 50% of the carbon content either in the tails or in the dust has been the usual experience of mills working on the Adirondack hard ores. There is thus much room for improvement.

A bulletin prepared by Harold L. Alling, and just issued by the State Geologist's office, gives a full account of the Adirondack deposits, with information as to the nature and tenor of the ores and other details of interest from the operating standpoint. It is not entirely apparent why the region should not have shared more fully in the recent expansion of the American industry, although the Alabama ores, no doubt, are easier to mine and to crush. On the other hand, the Adirondack rock carries 1 or 2% more graphite on the average and produces a cleaner, brighter flake. The general average of the mined rock is about 5%, as compared with 3%, estimated[1] for the Alabama ores.

Chief Consolidated Mining Co.—The earnings for the third quarter of 1918 show a reduction from the previous quarter, resulting from lowering in grade of the ore shipped and higher smelting and mining costs. Development costs were increased largely, owing to the sinking of a new shaft and exploration by diamond drilling. A dividend of 12½c. per share was paid on Nov. 1, 1918.

*Assistant state geologist, Albany, New York.

[1]B. L. Miller, Vol. 21, *Mineral Industry*.

Manganese Ore in East Tennessee

BY HENRY V. MAXWELL*

As pointed out by the U. S. Geological Survey, and as evidenced by recent development, manganese exists in Tennessee on three distinct ranges, in a belt approximately 25 miles wide, and extending almost from Georgia to the Virginia line paralleling and a short distance to the west of the Ozark Mountains.

Production from East Tennessee has, until recently, amounted to only a trifling tonnage of manganese ore. This is due to rather low manganese and relatively high phosphorus content. Though known to exist for a long time, the deposits had been lying idle until war demands and high prices suddenly stimulated search and production, which became particularly active in the three eastern counties, Unicoi, Carter, and Johnson. A number of washing plants have been erected, and production, though relatively small, continued to increase until the armistice was signed.

The Southern Manganese Corporation, with electric-smelting furnaces at Anniston, Ala., is the largest operator, having had seven producing mines in the district. In March this company started work on its No. 1, No. 2 and No. 3 mines in Scotia Valley, Unicoi County, and built a fairly complete treatment plant for its No. 1 and No. 2 mines, the plant being provided with log washers, grizzlies, trommels, picking belt, and Harz jigs. No production was made until October, when 140 tons was shipped to Anniston. Here, as generally throughout the district, the manganese lies upon limestone beneath a decomposed quartzite, which is scraped off so that the ore may be removed from open pits.

Northward, at a distance of about four miles, on the northern slope of Little Mountain, in Carter County, the Max Mining Co., of Braemer, Tenn., has done some development on the Patton and Winters land. Here the ore, in the form of small grains to lumps weighing as much as 400 lb., is mixed with clay. It is estimated that there is about 15% of high-grade ore in the clay bed, which is approximately 40 ft. thick somewhat below the surface. The lateral extent of this bed has not yet been determined. Ore was followed on the surface for about a mile from the Patten development to the Winters mine, where a pit was sunk through 10 ft. of ore. A 30-ft. log washer was installed here, and a shipment of two cars made, the analyses of which have not yet been received. Two additional washers were purchased by the Max company, but were not installed before the market for ore ceased to exist.

At Valley Forge, five miles beyond the Max, A. D. Reynolds has installed four log washers and has shipped five cars of ore to the Bethlehem plant. The shipment ran over 40% manganese. On Pond Mountain, I installed a one-log washer and shipped 11 cars of ore. At Blue Springs, Carter County, W. S. Douglas built a two-log washer, and has shipped two cars of ore. At Butler, A. H. McQueen has mined and shipped between 25 and 30 cars of ore.

In the Mountain City district the Southern Corporation installed a two-log washer at the Doe Valley mine and shipped 360 tons of ore carrying 22 to 52% manganese concentrated from ore carrying about 6% of manganese. The same company has shipped 550 tons of ore from Taylors Valley, where it has had about 100 men at work. It has also shipped 550 tons from Shady Valley, where there had been installed a complete washing plant with a capacity of 35 tons per day. From the Neeley the corporation has shipped 63 tons of high-grade ore without washing.

The following table gives a summary of the shipments from the Eastern Tennessee district made during 1918, all of which was in the form of washed concentrates excepting that from the Neeley mine, which was hand-sorted ore.

EASTERN TENNESSEE MANGANESE SHIPMENTS, 1918

Locality	Shipment	Per Cent. Mn	Per Cent Fe	Per Cent. SiO_2	Per Cent. P
Scotia Valley	140 tons	26.0	20.0	13.0	0.15
Winters Mine	2 cars	.....	.....	.....	.....
Winters Mine boulders	.....	58.59	0.55	4.35	0.14
Valley Forge	5 cars	40.0	.....	.....	.....
Pond Mountain	2 cars	47.83	7.97	4.50	.....
Pond Mountain	9 cars	46.76	11.96	4.63	0.22
Blue Springs	2 cars	45.0	.....	.....	.....
Butler	28 cars	45.0	.....	.....	.....
Doe Valley	360 tons	22 to 52	2 to 14	2 to 25	.....
Taylors Valley	550 tons	25 to 45	2 to 5	18 to 30	0.15
Shady Valley	550 tons	25 to 46	6 to 12	6 to 15	0.20
Neeley Mine	63 tons	49.0	.....	.....	.....

*Hampton, Tenn.

Vanadium in 1918

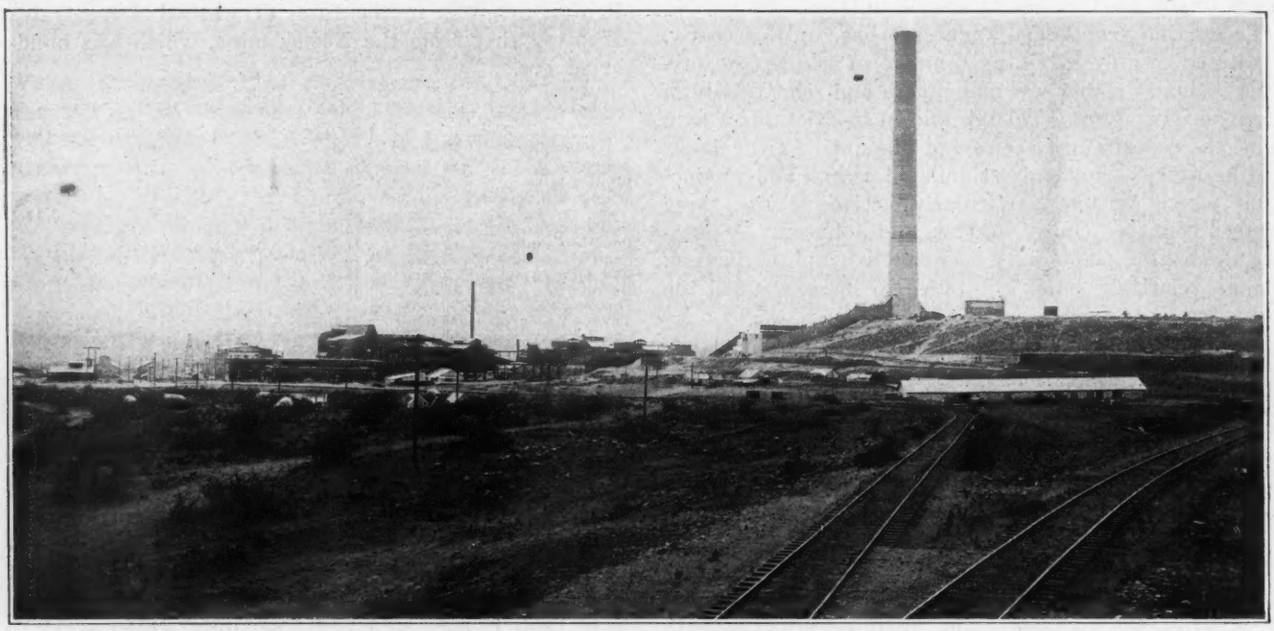
The domestic production of vanadium previous to the war, compared with that of 1918, varied only a few tons, but the demand for ferrovanadium increased considerably. The greater part of the world's supply of vanadium comes from Peru. Colorado is the second largest producer. The annual importation of vanadium ore from Peru is approximately 3500 tons, which could be considerably increased but for lack of shipping facilities.

The chief producers of ferrovanadium are the American Vanadium Co., the Electro-Metallurgical Co., the Goldschmidt Thermit Co., and the Standard Chemical Co. Ferrovanadium contains from 30 to 35% of vanadium, and is made by reducing vanadium oxide with iron in a crucible by means of carbon. The prevailing price for ferrovanadium in 1917 was $3 per lb. of vanadium content, and during 1918 the price was $7.50. Vanadic acid, c.p., in 1918, sold for $11 per lb., and that containing but 85% V_2O_5 was only $1.20 per lb. The price of ammonium meta vanadate was $7.50 per lb., and the ferrovanadium containing 25% oxide was 90c. per lb., according to the quotations of the Foote Mineral Company.

During the last two years there was an increased development of vanadium deposits of Arizona and New Mexico. A new 50-ton mill was built by the United States Vanadium Development Co. at Kelvin, Ariz., to use the Bryan process of concentration. The American Vanadium Co. and the other Colorado producers operated their plants to the fullest capacity up to the signing of the armistice, when the market demand ceased, and they now have a large stock of material on hand.

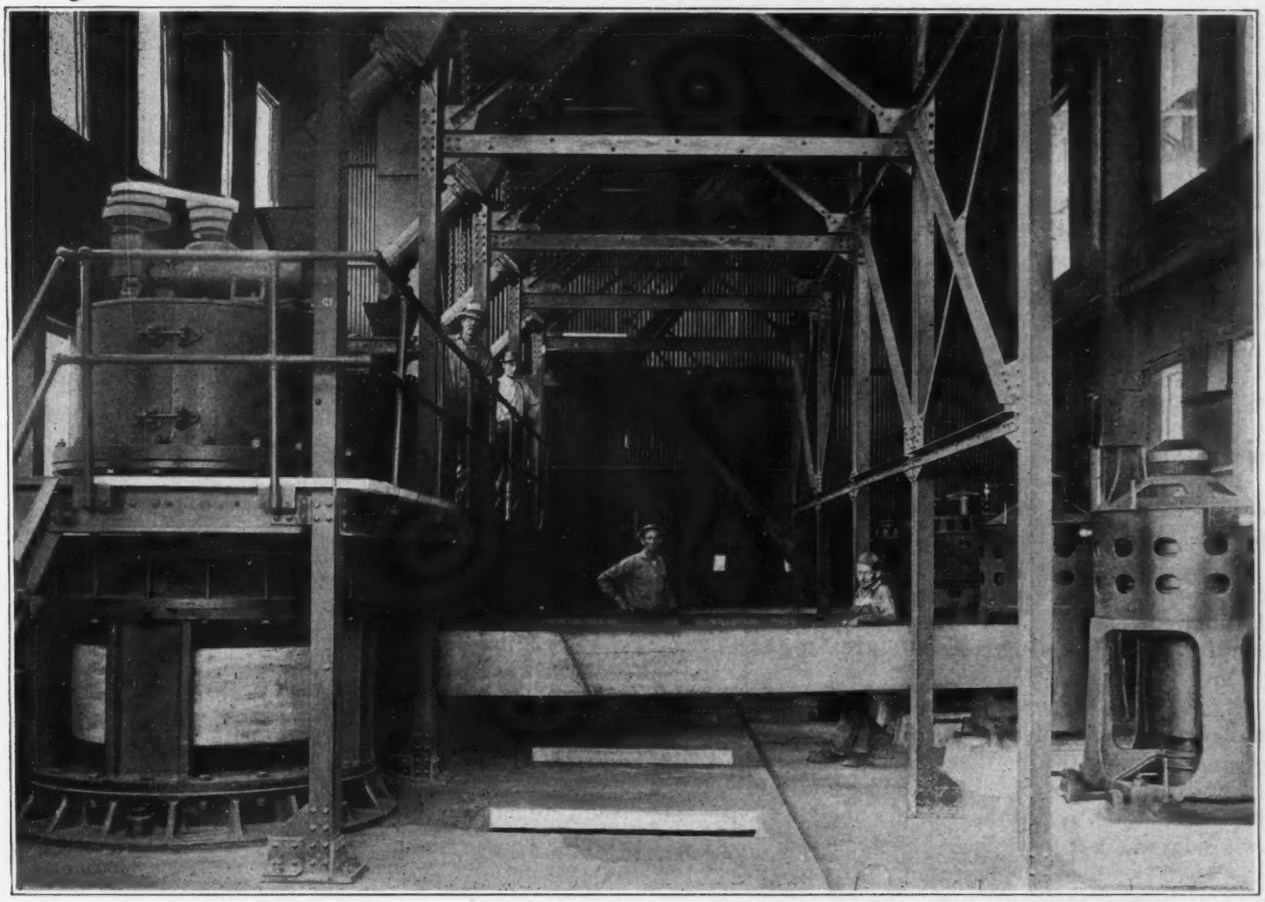
Vanadium acts as a cleanser and deoxidizer of molten steel, and a small percentage increases its tensile strength and toughness. The alloy with iron is used for high-speed tools and similar purposes, as the vanadium content increases the hardness of the cutting edges of the tools. Where used with chromium, in steel, it produces great resistance to repeated shock, making it especially suitable for steel springs, locomotive tires, and for military purposes where great resistance to shock is required.

United Verde Extension Smeltery

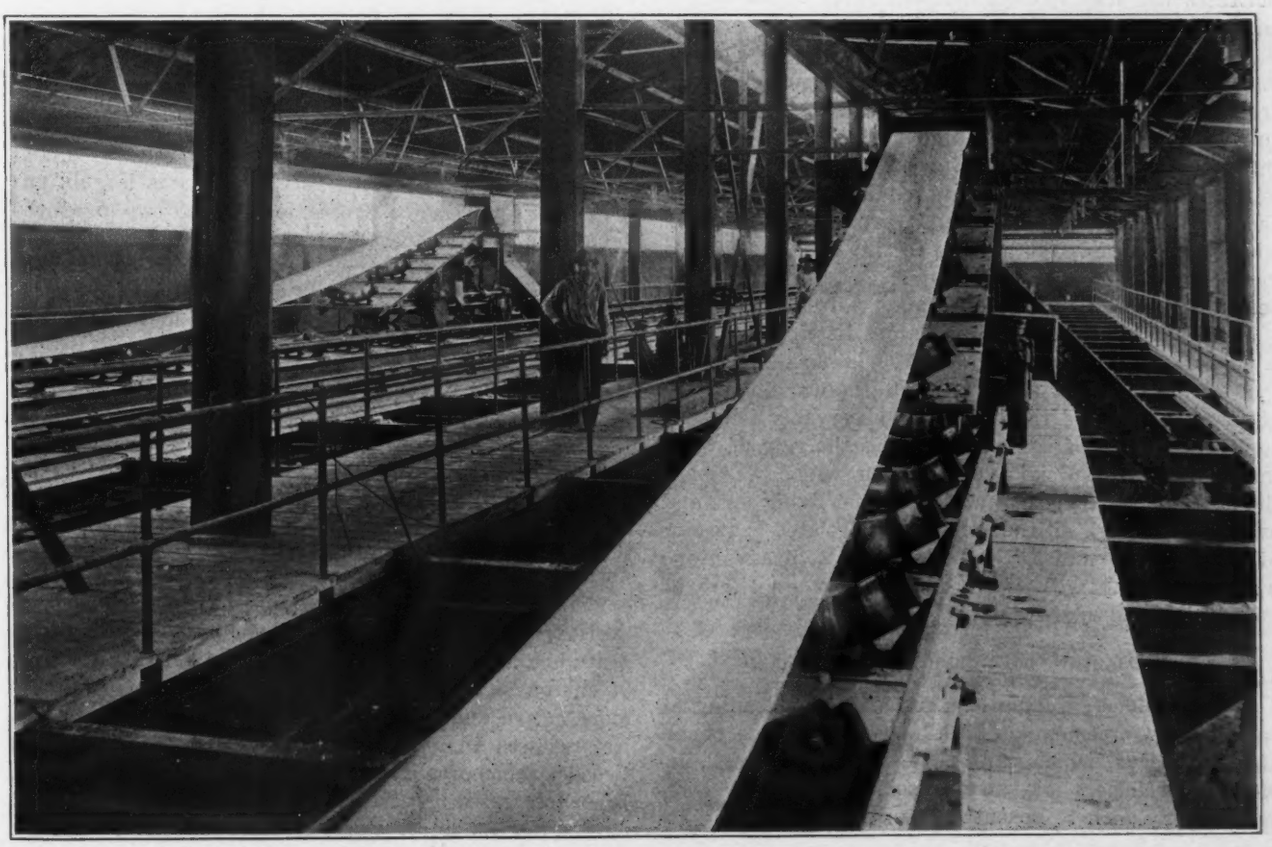


GENERAL VIEW FROM THE WEST OF UNITED VERDE EXTENSION SMELTERY AND CONVERTER PLANT

INTERIOR OF POWER HOUSE AT UNITED VERDE EXTENSION PLANT DURING CONSTRUCTION



BALL PULVERIZING MILLS IN COAL CRUSHING PLANT AT UNITED VERDE EXTENSION SMELTERY



BEDDING BIN CONVEYORS AT UNITED VERDE EXTENSION SMELTERY, CLARKDALE, ARIZONA

Mining in Colorado in 1918

BY GEORGE E. COLLINS*

THE last year of the war was probably the most disastrous which the mining industry of Colorado, as a whole, ever experienced. It seems certain that the artificial restrictions on prices, the increased wage scale and freight rates, and other economic conditions resulting from the war, bore more hardly on the small producers everywhere than on the larger ones, and Colorado is typically a district of small mines. But why small producers should have been more unfavorably affected in Colorado than elsewhere is not so easy to explain. In my opinion, the principal reasons were the following:

1. The majority of Colorado mines have for years been operating on an unduly narrow margin, which disappeared entirely in the face of unfavorable conditions.

2. The deposits being mostly fissure veins, or other ore occurrences of relatively small size and irregular distribution, increased cost of labor and explosives tended to raise operating costs to a greater degree than in other Rocky Mountain states.

3. The industry depends essentially on cheap smelting and freight rates, which are, in effect, a first charge on the proceeds. By the increase in these, a great quantity of low-grade ore became unprofitable, and much high-grade ore, which occurs as bunches together with the low-grade, was left unworked in consequence.

4. As to Colorado zinc ores, notwithstanding that the price of spelter remained high, the proportion of the spelter value paid to the producer of zinc ores and concentrates was less, so that the base price on which the miner was actually paid was no higher than before the war, though the average cost of mining increased more than 50%. Moreover, most Colorado zinc ores contain "residue" values in silver, gold, lead, or copper. Not only had these to bear the higher freight rate to the smelteries, in Oklahoma or Kansas, but the "residues" were saddled with a correspondingly higher freight rate back to Colorado, and the metals produced from them with an increased freight rate to the East. All these increases were borne by the miner, who therefore experienced the full benefit of Federal railroad operation.

5. In many of the more isolated districts, efficient labor was absolutely unobtainable. In no district did the cost of labor bear any relation to the wage paid, and at many properties there was an observable tendency for the efficiency of labor to lessen as the rate of wage increased. The special type of labor which was once the mainstay of Colorado mining is fast dying out, and owing to the high altitude and to the isolated character of most of the mines, the state is at a disadvantage when competing with other districts for its share of labor, when the total supply is insufficient.

CAR-LOADING REGULATIONS ILL-ADVISED

6. Ill-considered regulations for maximum loading of cars, and enforcement of prohibitive demurrage penalties for delays, which cannot be avoided by small, irregular producers in snowy, isolated districts, compelled many such to go out of business. These regulations were not only inapplicable to local conditions, but, as Colorado narrow-gage roads have a surplus of equipment which cannot be used on standard-gage tracks elsewhere, were entirely unnecessary. Later in the year, it was realized that the regulations were driving the small mines out of business, and the rules were tacitly relaxed, but the harm had already been done.

To illustrate the absurdity of these regulations, I will state that on one narrow-gage road the marked capacity is 25 tons, and 10% overload is permitted. If cars proved to be loaded with even a couple of hundred pounds less than the maximum permissible, including overload, letters would be sent out from the Federal Administration demanding an explanation; though, if the overload exceeded the maximum by an equal amount, another branch of the same administration would threaten dire penalties. There are no track scales in the district on which ore could be weighed, and much of the equipment will not stand loading to nominal capacity without breaking down.

7. The unwise and grossly unjust provisions of the Excess-Profits Act, which, as applied to leasing and prospecting, where one may expect only an occasional success to recoup the losses incurred in many failures, result practically in taking the lion's share of any profit, though not allowing for losses, discouraged this kind of mining, which was previously carried on extensively. It is not so much that the amounts actually collected were large, for in most cases there were no profits, excess or otherwise, as it was that enterprise was discouraged.

MANY PROPERTIES IN BAD FINANCIAL CONDITION

Whether or not I have correctly indicated the causes of the critical situation of Colorado mining, the fact is beyond question. The output, particularly of gold, fell off most seriously; that of base metals was largely unprofitable; and many properties which, two or three years ago, were generally regarded as permanent and financially solid, were on the verge of bankruptcy at the end of the year. Worst of all, a large proportion of the smaller mines and prospects went out of existence altogether.

Most of these conditions were foreseen and their effect was predicted. However, in the face of the extraordinary ineptitude or lack of concern shown by the various authorities to whom was intrusted the responsibility of guiding producing industries through the war period, warnings were useless, and it is poor consolation to be able to say afterward, "I told you so."

During the last three months of 1918 the influenza epidemic proved a most serious hindrance. The mortality from pneumonia is always much increased at high altitudes, and this, together with the scarcity of competent physicians and nurses, owing to so many of the more active and efficient having entered military service, resulted in a high death rate. At Silverton and Creede, the mortality for a short time was appalling. In many cases a strict quarantine, though a great burden on industry, was decidedly effective. At the time of writing, it seems that quarantine is of doubtful

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benefit in the long run, for sooner or later the disease slips through, and the resulting epidemic, finding virgin soil, is just as severe as it was during its first outbreak elsewhere. The most efficient safeguard so far seems to be inoculation, which reduces both the percentage of cases and the severity of the disease.

The outlook for the immediate future, in my opinion, is discouraging. No revival of gold mining can be hoped for until either the cost of supplies and labor (the latter measured in terms of work accomplished) falls to at least pre-war figures, or the value of gold is adjusted, directly or indirectly, to correspond with the costs. Even then, the losses which the industry has suffered during the last two years are so serious that it will take a long time to respond to any stimulus.

Gold and Zinc Mining Profitable in Few Cases

The situation as regards zinc is no more encouraging. For gold and zinc alike, profitable production under present conditions is possible only for a few exceptionally rich mines.

For lead producers a price around $7 should be sufficient; but, unfortunately, it seems that the state does not now contain many deposits which can produce lead profitably except at high prices. It is still true that Colorado has no copper mine of importance, although both at Red Mountain and in Gunnison County there are fair chances of developing copper mines.

As to silver, it is evident that no increased production can be expected until the increase in price is more than equivalent to the increase in mining costs. Dollar silver, with present costs, is unprofitable in Colorado, being merely the equivalent of 60-cent silver before the war. To stimulate silver production in the state, either the price must go up or the costs come down. I personally look for the latter in the near future. The improvement is to be expected, first of all, in increased efficiency of labor. Some evidence of this showed itself during December.

Important Districts Reviewed

I will now mention the more important districts in the state separately:

At Leadville, the closing down of the Leadville Unit operation of the United States company, which was started to unwater and develop in depth the Fryer Hill district, was a great blow. No ore was found on the "lower contact," as anticipated. The Iron Silver company closed its Moyer and Tucson properties, but continued its operation at the Mikado. Control of the Yak Tunnel enterprise was acquired by the American Smelting and Refining Co. The Down-Town Mines Co. extracted a large tonnage of ore through the Penrose shaft. The Greenback mine was operated for pyrite ore by the Western Chemical Co., of Denver. Considerable low-grade manganese ore was mined and shipped, but unfavorable market conditions reduced the production during the second half of 1918.

The Cripple Creek district, which produces nothing but gold, inevitably suffered as a result of labor scarcity and high costs, and the output fell off seriously. The Cresson continued to realize large profits, for the ore is rich enough to stand increased costs. But the other mines made little profit, and some closed down altogether. In the early summer, the Portland company closed down its mill at Colorado Springs, and, later, its Portland mill, above Victor, much of the equipment being used in enlarging the Independence mill. Such high-grade ore as was still being mined at the end of 1918, principally by lessees, was shipped to the Golden Cycle plant at Colorado Springs, which now affords the only outlet for the high-grade milling ores of the district. It is not, however, being supplied at anything like full capacity.

It was reported that ore of good grade was cut in the branch from the Roosevelt Tunnel, which is being driven to connect with the Portland No. 2 shaft, and also in the lower levels of the Vindicator. However, though it is probable that high-grade ore will be found at depth thoughout the district, no large bodies were discovered.

Telluride Active and Prosperous

Of the various camps in the San Juan district, Telluride was by far the most active in 1918. In fact, it is now the only really prosperous mining town in the state. The Liberty Bell realized a fairly large profit, and was able to overcome the effect of the increased wage scale by adopting the contract system of mining. The Tomboy made fair profits, but had to draw on its reserves of broken ore. The Smuggler Union probably did little better than break even.

Owing to scarcity of labor, due to the influenza situation, the new operation of the Tonopah Belmont company in Alta Basin was closed down for the winter.

At Ouray, the Camp Bird deep-level tunnel intersected the vein early in the summer, but did not open up ore of commercial grade in quantity. Work is at present suspended, owing to a serious outbreak of influenza. The other mines in the district found it difficult to make both ends meet in the face of advancing costs, notwithstanding the increase in the price of silver.

At Silverton, the Sunnyside dominated the situation, and, by a successful application of differential flotation to its large bodies of low-grade complex ore, will probably achieve a success which may point the way to the successful operation of other mines of similar character. This mine was, however, greatly hampered by shortage of labor, which was not lessened by an ill-advised wage increase during the autumn, the only effect of which was to compel other mines and districts throughout the state to meet the advance, without in the least improving the supply of labor.

The production of the San Juan district was held back somewhat by conditions at the Durango plant of the American Smelting and Refining Co., which limited the tonnage that could be purchased, but most of all by labor scarcity and inefficiency. If it were possible to remove these hindrances, the output could certainly be increased.

At Creede, the American Smelting and Refining Co. undertook to reopen some of the principal mines along the Amethyst vein below the tunnel level. Interest was stimulated by the discovery by a leasing company of a large body of silver ore of shipping grade in the Monon, a property which had been unworked for years.

At Aspen, production was retarded by scarcity of labor, and for this reason the high prices of lead and silver did not result in increased enterprise, or in

greater prosperity to the operating mines. The heavy fixed expenses for pumping and maintenance, with a lessened output, increased costs in proportion.

Rico suffered because of the virtual exhaustion of the copper orebodies of the Rico-Wellington mine, which was the principal shipper of the district a few years ago. The possibilities of silver production from this district are still considerable, but there is no probability of increased output in the immediate future.

Dredging Profitable Around Breckenridge

The gold dredges in the Breckenridge district were able to operate successfully in 1918, largely because this kind of mining depends more on cheap power than on labor. The Wellington mine also continued large and profitable production, but its output was considerably reduced by the prevailing labor conditions. Other probable zinc producers in this district were being developed at the year's end.

In outlying districts, such as Montezuma and the Gunnison County camps not near the railway, it was almost impossible to operate, miners being practically unobtainable; and conditions were nearly as bad in Park County.

Central City and Idaho Springs, with a more permanent and settled mining population, were able to keep some mines in operation, without competing with the extravagant wage scales current elsewhere. But both districts, especially the former, were short of men, and few, if any, mines in either district were able to meet expenses. Around Georgetown, work was resumed on several of the older properties, but without notably successful results as yet.

In Boulder County there was some increase of work in the silver-bearing properties, but in the tungsten field activity was greatly reduced, pending decision as to tariff protection. At the time of writing there seems to be no market for tungsten concentrates, and unless this condition improves in the immediate future most of the mines will close down.

The mines producing the rarer metals, such as tungsten, molybdenum and vanadium, were all affected by the uncertainty as to future demand and price. The Climax company and the Urad mine of the Primos Chemical Co. are in a position to maintain indefinitely a large production of molybdenite if market conditions warrant it.

As a whole, it may be stated that the problems of readjustment to pre-war conditions present features of exceptional difficulty in Colorado.

Mexico—Our Balkan Problem

It is growing increasingly evident that something must be done about Mexico. The tone of the press comment of the country is that it is a disagreeable task that has been held in abeyance, but must eventually be attended to, and attended to right, unless we want to have an army prepared for periodic junkets to the Rio Grande similar to the one that preceded by a few months our entrance into the Great War.

Going on the supposition that no news is good news, the country had begun to hope that Mexico, under Carranza, had become pacific and friendly, though the Zimmerman note and the Provisional President's birthday greeting to the Kaiser left a disagreeable memory. But the censorship appears to have slipped a couple of times of late, and news has become public of clashes on the border and an attack on an American naval guard in Vera Cruz. There is a suspicion that there have been other troubles that were kept quiet while our affair in Europe was being disposed of, and that the news of these clashes was finally let slip premeditatedly to prepare the country for the revelation that there is still a problem to be solved in our sister republic. As Colonel Roosevelt so aptly phrased it, "Mexico is our Balkan problem."

There would be much trouble and little glory in pacifying Mexico and establishing a stable government there, but it begins to look like our job, unless we can turn it over to the League of Nations for it to cut its teeth on.—New York *Tribune.*

There is nothing like a specific instance to illuminate a general theorem. Mexico, in the opinion of numerous Americans, is making war on the United States. It is a covert war, a war without a declaration or a trench line; but, in the estimation of its victims, at least, it is a war of spoliation hardly inferior in essential flagrancy, though of less sensational semblance, to the lootings by Germany in Belgium and northern France. Beyond question it is being waged by the Mexican government and not by irresponsible individuals.

Now, the interesting question that occurs to us is: What if the League of Nations be constituted as contemplated by President Wilson and, possibly, one or more European statesmen—what would be the effect upon the Mexican situation? Would the Government and people of the United States of America retain the right to demand and enforce redress of grievances against the Mexican government? Or would the League of Nations examine and adjudicate our claims?

Assuming that the decision were against Mexico, would the League make the United States its mandatory to enforce the decree? Or would it send a French or British or Brazilian or Japanese army into Mexico to enforce it? Or would it attempt to coerce Mexico by international boycott? Or, if the decision were against the United States, would the League compel the American people to accept cordially what they regarded as a wrong and to take the people inflicting the same to their hearts in mutual trade and in international social intercourse? If so, how would the compulsion be effected? With the armies and navies or by universal boycott?—New York *Sun.*

Bulletin on Mining Statutes Ready

The U. S. Bureau of Mines has issued the first of a series of bulletins containing the mining statutes of different states. This is Bulletin 161, entitled "California Mining Statutes Annotated," by J. W. Thompson. The purpose of the bulletin is to point out the laws and regulations best adapted to increase safety and efficiency in the mineral industry and to aid legislative bodies in framing uniform mining laws. The Bureau will follow this pamphlet with others that will contain complete collections of the mining statutes of the several states. This bulletin is sold by the Superintendent of Documents, Government Printing Office, Washington, D. C., for 20 cents.

Should the Government Own the Telegraphs?*

BY CLARENCE H. MACKAY†

AN ARTICLE by the Postmaster General, Mr. Burleson, in the *American Review of Reviews* for December, 1918, strongly advocating Government ownership and operation of telegraphs, in accordance with his recommendation in his annual reports in the past as Postmaster General, raises the question very sharply, now that the Postmaster General has actually seized the telegraph lines under the war power of the Government, even though he has to return them when the treaty of peace is signed. Mr. Burleson's argument is cheapness of rates; any deficit to be paid by taxation. Is that argument sound?

USE OF TELEGRAPH LIMITED

The telegraph differs from every other public utility, in that the telegraph is not used by the great majority of people. Farmers use it very rarely. The laboring classes use it little, if at all. The clerical classes have little occasion to use it, and even the social use of the telegraph is negligible. One of the great telegraph companies states that only 3 or 4% of its entire telegraph business is from these classes. Over 70% of the entire telegraph business of the United States originates in 40 cities, these being the largest commercial cities of the country, the population of which represents 20% of the total population of the country. The fact is that the telegraph is a commercial agent, almost exclusively, and its expense is a part of the cost of the business of the banker, broker, manufacturing, and mercantile classes. Hence any attempt to give them cheap telegraph service at the expense of the taxpayer is unfair and discriminatory.

The sites of post offices are selected with a view to serving the whole population of each city, town, and locality, and in most cases are not so located as to serve that part of the public that uses the telegraph in its business; and Mr. Burleson's idea, that the public must come to the post office to transact telegraph business, no matter where the offices are situated, will not appeal to those who in the rush hours of the day must conserve their time and the time of their employees.

The banker, broker, manufacturer, or merchant wishes quick and accurate telegraph service, and does not want slow telegraph service or inaccurate service. He is willing to pay a fair price for his telegrams, and he considers the present telegraph rates as fair. He does not wish or expect to get cheap telegraph service at the expense of speed and accuracy, and especially so to get this cheap service at the expense of the taxpayer. He is not interested in this movement for Government ownership and operation. Neither is the taxpayer in its favor; nor are the great mass of people, who do not use the telegraph at all, and would not use it even if the charges were less. Hence I see no occasion for the Government interfering with the present competitive system.

In Europe the governments own and operate the telegraph systems, but instead of their telegraph rates being cheaper than the American rates, they are higher, to say nothing of the well-known inefficiency of the telegraph service throughout Europe. I have yet to learn of a business man who has traveled abroad and who does not hold this view. Telegraph rates in the United States are the cheapest in the world. This is not generally understood, because the published rate abroad seems cheap until one ascertains that every word in the address, signature, and in matter extraneous to the message proper, is charged for, as well as every word in the body of the message. In the United States only the words in the body of the message are charged for. Now, in the United States there are 14 words on the average in the address, signature and direction matter, in a telegram, in addition to the words in the body of the message. The following gives the comparative toll on telegrams of 10 text words: France, 29c.; Norway, 29c.; Sweden, 25c.; Great Britain, 30c.; Germany, 30c.; Italy, 29c.; Denmark, 30c.; Austria, 29c.; United States, 25 to 30 cents.

The above rate at 25 or 30c. for telegrams in the United States is between two points in the same state, the distance being about the same as between two points in any foreign country. When we come to telegrams in the United States for longer distances, the only comparison that can be made with European rates is telegrams in Europe between different countries, on account of the long distances traveled by the average long-distance telegram in the United States. For instance, from Paris to Vienna is about 650 miles, and the cost for a 10-word message, plus the address and signature charged for, is 96c., as against only 40c., address and signature free, for a similar distance in the United States. From Stockholm to Paris (1000 miles) the rate for a 10-word message, plus the address and signature charged for, is $1.20. From New York to Chicago, about the same distance, the rate for a 10-word message, address and signature free, is 50 cents.

CONVENIENCES DENIED IN EUROPE

In addition to the above there are other advantages of the American system. The American telegraph companies send messengers to collect and deliver telegrams and maintain call-box systems. The American companies keep open accounts for their customers and keep offices in hotels, apartment houses, and competitive offices in all parts of large cities. The European governments do nothing of this kind. There the telegram must be taken to the telegraph office; the sender cannot run up an account; he must prepay the charge, and may have to go a long distance before finding a main or branch office.

American business supremacy is based upon the dispatch and facility with which things are accomplished. The American business man will never consent to the substitution of European methods of handling telegraph correspondence as now proposed by the American Postmaster General. Here, the business man prepares a batch of telegrams and cablegrams, rings for a company's messenger by means of a convenient call box installed free of charge by the company, and dismisses

*From the New York *Times* of Dec. 22, 1918.
†President of the Postal Telegraph-Cable Company.

them from his mind. Competition insures their prompt transmission under a charge account. In Europe the business man must first reckon the cost of his messages, and send one of his employees to a post office with them or go himself. The postal clerk calculates the charge—when he finds time; one must purchase stamps and affix them, hand messages back to the postal clerk and trust to Providence that they will reach their destination in an intelligible manner. Complaints are met with a shrug of the shoulders.

Cheaper Rates Would Not Increase Use

Mr. Burleson thinks that cheap telegrams would increase their use by the great mass of the people. He gives no reason for thinking so. Nobody uses the telegraphs for transmitting communications unless those communications are more or less urgent, and a cheap telegraph service would not appeal to the great mass of people, because their communications are not of an urgent nature. They probably would not use the telegraphs to any greater extent at the 15c. rate than they do now at the 25c. rate. The telephone has displaced the local use of the telegraph; in other words, has displaced telegrams between towns not far distant.

The telegraph, in the course of trade, and by the competition of the telephone, has become more or less restricted to the use of the banker, broker, manufacturer, and merchant in carrying on commercial transactions, and they do not want the telegraph service injured by cheapness, slowness, or inaccuracy. The great mass of the public are not interested at all in the subject, excepting, of course, that they do not wish to have their taxes increased. Is the taxpayer to be ignored?

British Government's Financial Loss

In Great Britain about 40 years ago the British government bought the telegraphs and paid about $50,000,000 for them. For two years, namely, 1870 to 1871, the government made a small profit after charging interest on the debentures issued for the purchase, but since that time there has been an annual deficit after providing interest. In a speech in the House of Commons on Apr. 30, 1914, Postmaster General Hobhouse, of Great Britain, said that within the last 40 years the telegraph expenditure of the British government exceeded the telegraph receipts by $110,000,000, not including interest on the original purchase money nor interest on the annual losses, nor any provision for amortization. If these were included the loss would have been $200,000,000.

Overhead Charges Negligible Quantity

Mr. Burleson states that at present the public pays overhead charges of the two telegraph companies, and also dividends on their capital stock. As to the dividends, they are reasonable, and the Government would have to pay the interest on the purchase price, and this would be a substitute for dividends. As to the overhead charges, the question at once rises whether the overhead charges of the two companies would compare for an instant with the increased operating expense if the Government should undertake the operation. The so-called overhead expense referred to by Mr. Burleson is the expense of supervision over the operations of a telegraph company, and this expense in the case of one of the largest telegraph companies is only about 2% of its receipts. Competent supervision by experienced managers whose salaries go to make up the overhead expense is more than offset by the economies effected by them in the cost of handling the traffic. No one who is familiar with the results of Government operation of anything will doubt for a moment that the overhead charges of the present two telegraph companies would be a drop of water as compared with the flood of increased operating expense if the Government ever acquired and operated the telegraph lines.

Furthermore, it is a well-known fact that the lines of the two telegraph companies are filled to capacity during the business hours of the day, and that the trunk lines are well occupied during the night, so that this disposes of any question of duplication of facilities.

After all, the main question is whether competition in telegraph service is wanted or not. Government ownership and operation means a monopoly. Continuation of the present two telegraph companies means competition. Competition means keen rivalry in service. It means efficiency. It means constant improvement of equipment. It means a greater desire to please, and more courteous treatment to the public.

If the American people prefer to take the chances of insufficient Government telegraph service, and the chances of getting a lower telegraph rate to be made up largely by taxation, and to take the chances of the telegraph systems being turned into a political machine for the benefit of the party which may happen to be in power, then Government ownership and operation of telegraphs will come. If, on the other hand, the public comes to realize that the telegraph service differs from every other kind of public utility, in that telegraph service is a commercial instrument practically for commerce alone, and is not used, and would not be used even under Government ownership, by the great mass of the people, and that any reduction in telegraph rates would be followed by taxation to make up the deficiency, and that the telegraph systems would certainly become political machines, and that the service itself would inevitably deteriorate in speed and accuracy under Government management, then there is little probability of Mr. Burleson's idea being adopted by the American people.

Dangers of Political Control

The American public is keenly suspicious of political influences controlling the wires for partisan purposes, and one of the most disastrous things that could threaten our free institutions, and which would aim at the very foundations of the Government itself, would be to allow the channels of communication, whether telegraph, telephone, or cable, to be brought under political control. Without a free telegraph you cannot have a free press, because the telegraph is the feeder of the press. Any proposal, therefore, that the Government take over the telegraphs might just as well embody a proposal to have the press controlled by the Government.

Where there are two separate and distinct companies, with absolutely no union of interest, fiercely competing for the telegraph business of the country, this danger of political control is removed, a condition far superior and far more desirable, from the standpoint of the national welfare, than a Government-owned telegraph system under the domination of a political administration.

Engineers Honor Herbert C. Hoover*

ALMOST coincident with the news that Herbert C. Hoover has assumed the direction of the distribution of food supplies to the neutral and enemy people of Europe, comes the announcement that American engineers have recognized the services rendered to humanity by their fellow engineer by making him the first recipient of the Washington Award.

Two years ago, John W. Alvord, of Chicago, made a gift to the Western Society of Engineers to establish a prize which is to be given annually to some engineer, "on account of accomplishments which have preëminently promoted the happiness, comfort, and wellbeing of humanity." "Almost all engineers serve the public directly or indirectly," said Mr. Alvord, "and it is one of the most important duties of engineering societies to point out to their membership and to the public such instances of engineering and administrative skill as seem to have unusual merit, in order that honor may be properly accorded where it is due." The award of this prize is made by a board of 17 engineers, of whom nine are chosen by the Western Society of Engineers and two by each of the four national societies.

In the whole history of engineering one will search in vain to find a man who has rendered a greater service than has Herbert C. Hoover. The story of how he organized the work of feeding the millions of people in Belgium and Northern France during the early years of the war is fresh in the memory of everyone. The marvelous efficiency with which he carried out this great trust led President Wilson, when the United States entered the war, to select Mr. Hoover to head the great work of organizing food production and food conservation in the United States.

Now comes a task far surpassing in magnitude and difficulty either of these. Substantially all Eastern Europe beyond the former German and Austrian battle lines is in peril of starvation. The work of husbanding the supplies these people already possess, and supplementing them with what can be brought overseas from the Americas, Asia, and Australia, is one of the most difficult tasks ever undertaken; yet all agree that upon its accomplishment depends the chance of checking the flood of Bolshevism and anarchy now rolling westward.

Mr. Hoover has been in Europe for several weeks coöperating with the officials of the Allied nations in an investigation of European food supplies and needs. On Jan. 3 it was announced at Paris that the Allied governments had requested the United States to take a predominating part in the organization of relief measures in all enemy and neutral countries, and that President Wilson had named Mr. Hoover to be director-general of the international commission which is to carry on this important work.

The countries liberated from the dominion of the Central Powers contain probably 125,000,000 persons, and the populations of Germany, Austria, Bulgaria, and Turkey doubtless make a total of more than 250,000,000, with whose food necessities this commission will have to deal.

At this time, when it is being rightly insisted that larger responsibilities should be given to the engineer in dealing with broad questions of public welfare, it is well for the profession to emphasize its appreciation of Mr. Hoover's great work. It should make the fact more widely known that he is an engineer, and one who had by his technical ability risen to the highest position among his professional brethren before he became an international figure.

The story has been told—but will bear retelling—of Mr. Hoover's notable career. He was born on an Iowa farm, worked his way through Leland Stanford University, graduating with high honors in 1895. He then followed his profession of a mining engineer, first in New Mexico and California and then in West Australia. In 1898 he was made chief engineer of the Chinese government's Bureau of Mines, but the Boxer rebellion of 1900 put an end to this work. He helped to organize the defense of Tientsin, and when the rebellion was over he found work for a few months in rebuilding Chinese railways and harbor works.

In 1901 he went to London, and, as a partner in the firm of Bewick, Moreing & Co., became a prominent figure in the organization of mining industry, first in Western Australia and later in other parts of the Orient. That it was his technical knowledge as well as his abilities as an executive and a financier which won him advancement is attested by the engineering treatises which he found time to write, the most important of which was "Principles of Mining," published in 1908, and which is a standard textbook on this subject.

The translation of Agricola's "De Re Metallica," which was published in 1912, was of itself a remarkable achievement. Agricola's treaties, which was perhaps the first mining and metallurgical treatise published, was originally written in Latin. The translation involved elaborate research of collateral literature. Many German works were consulted. The result of the painstaking work of Hoover and his wife was a book of absorbing interest.

Everyone knows with what suddenness the Great War broke out in the summer of 1914. Another man than Hoover might have reasoned that his interests in the mining industry needed all his time and attention at such a period of chaos; but it is characteristic of him that he threw himself heart and soul into the work of a hastily organized American committee which undertook the task of rescuing the 100,000 or so Americans who were caught unaware by the war's outbreak and were panic-stricken over the difficulties of getting home.

Hoover's ability and public spirit were so well known in the American colony in London that when the task of organizing relief for the Belgians was undertaken, the late Ambassador Page was in no doubt where to turn to find a man equal to the need. Mr. Hoover has since been devoting his time and ability to works of public service, and without compensation other than the consciousness of duty well performed.

Engineers have long been insistent that the members of their profession were capable of performing great things if given the opportunity. Mr. Hoover's recent work is remarkable and striking proof of the soundness of the claim.

*Abstracted from *Engineering News-Record*, Jan. 9, 1919.

Mining Stocks in 1918

THE stock market of 1918 was characterized by few extreme fluctuations, and in spite of war conditions there was considerable steadiness. The curtailment of credit undoubtedly acted to prevent excessive speculation. Toward the close of the year there was a sharp drop, from which the principal stocks quickly recovered. The uncertainty marking the closing events of the war undoubtedly produced a softness to the stock market in general.

The accompanying tables show the quotations and transactions on the New York and Boston Stock Exchanges and those of the more important stocks on the New York Curb, the latter being from the records of the Curb Quotation Co. of New York.

With reference to the table of Curb quotations, it should be noted that these are not official, although they are probably as reliable as can be obtained. On the New York Stock Exchange every precaution is taken to insure that quotations are authentic; on the Curb, however, there are no restrictions whatever, and anyone can make prices and have them recorded in the published lists. It is, therefore, impossible to vouch for the trustworthiness of the prices, and they are printed merely as a matter of record.

MINING STOCKS ON THE NEW YORK STOCK EXCHANGE

Company	1915 High	1915 Low	1916 High	1916 Low	1917 High	1917 Low	Range Year 1918 First	High	Date	Low	Date	Last	Total Sales
Alaska Gold Mines (*d*)	40½	21½	26½	10¼	11⅛	1	1⅜	5⅜	Nov. 6	1¼	Apr. 27	3½	354,125
Alaska Juneau Gold Mining (*d*)	13½	9¼	10⅜	6⅜	8⅛	1⅜	2¼	3⅜	Jan. 11	1½	Apr. 1	1⅜	558,550
Amer. Smelt. and Ref. Co.	108⅜	56	123¾	88⅛	112⅜	67⅛	80	94⅜	Oct. 18	73	May 28	76½	2,186,194
Amer. Smelt. and Ref. Co. pf	113	100	118⅛	109¼	117¼ (*h*)	99½	104⅜	110¼	Nov. 12	103	Sept. 25	103⅞	20,062
American Smelters pf. A	92	86	102	91⅜	102½	90½	93¼	96	Nov. 15	89	May 25	95	4,760
American Smelters pf. B	85⅜	78	97¼	84⅜	99¼	90¾	....	....	....	....	....	....	....
Amer. Zinc, Lead and Smelt. (*b*)	71½	67¼	97⅞	29⅜	41⅜	10⅜	14	21⅜	July 3	11	Dec. 30	11¼	175,800
Amer. Zinc, Lead & Smelt. pf. (*b*)	71½	67¼	87	59½	72⅜	39⅜	41	53¼	July 1	38¾	Dec. 30	43	16,665
Anaconda Copper Mining Co. (*a*)	91⅜	49⅜	105⅜	77	87	51⅜	62	74⅜	Oct. 18	59	Dec. 30	60⅜	2,672,520
Batopilas Mining (*c*)	4½	⅜	3¼	⅜	2¼	⅜	1½	2⅛	Nov. 14	1	Jan. 4	1⅜	96,450
Bethlehem Steel Co.	600	46¼	700	415	515	66¼	76¼	96	May 16	60	Dec. 30	61¼	73,135
Bethlehem Steel, Class B, com.	....	....	....	....	156 (*h*)	66¼	75¼	94	May 16	59¾	Nov. 12	61¼	4,976,410
Bethlehem Steel Co. pf	184	91	186	126	135	84	90	94	Sept. 23	84	Dec. 28	89½	5,600
Bethlehem Steel, 8% pf.	....	....	....	....	101½	93	98½	106¼	Apr. 29	96½	Jan. 15	104¼	127,015
Butte & Superior (*d*)	79⅞	53	105¼	41⅜	52¼	12⅜	16⅜	33½	May 14	16½	Jan. 2	17¾	381,750
Butte Copper & Zinc (*e*)	....	....	....	....	....	....	10½	12⅞	July 10	5¼	Dec. 30	5⅜	133,580
Calumet & Arizona (*d*)	....	....	....	....	....	....	65	71	May 15	61	Dec. 30	61	11,600
Cerro de Pasco, (*g*)	....	....	....	....	41	25	30½	39	Nov. 12	29¼	Mar. 6	33	127,952
Chile Copper (*b*)	26⅜	23⅜	39¼	19⅜	27⅜	11⅛	17	24	Oct. 18	14½	Apr. 4	18	451,390
Chino Copper (*e*)	57⅜	32⅜	74	46⅜	63¾	35¼	42⅜	47¼	May 16	31⅜	Dec. 28	33½	310,710
Colorado Fuel and Iron	66½	21⅜	63⅛	38⅛	58	29¾	36½	54⅞	May 24	34⅜	Jan. 29	36⅛	385,540
Con. Inter. Callahan (*d*)	....	....	28½	18	21	7	8	13	June 21	7½	Sept. 23	8¼	18,700
Dome Mines (*d*)	30½	16	29⅜	18	24⅜	6½	8⅜	15	Nov. 1	6	June 19	11⅜	211,615
Federal Min. and Smelt.	60	8	35	12⅜	26⅛	8¼	13½	15	Oct. 1	9	Dec. 30	9¼	9,070
Federal Min. and Smelt. pf.	65	20	57⅛	35½	54⅜	28	35⅜	44½	Oct. 18	27	Jan. 10	37⅛	33,918
General Chemical Co.	360	165	350	285	250	153	175	185	Aug. 12	165	Jan. 26	168½	4,034
General Chemical Co., pf.	116	106	117	113½	113	100	103⅜	103⅜	Jan. 24	99½	June 24	103	3,275
Granby Consolidated	91	79½	120	80	92⅜	65	78½	86	Oct. 23	74	Jan. 25	78½	41,715
Great Northern, ctfs. for ore prop.	54	25⅛	50⅜	32	38½	22⅜	27½	34½	Nov. 14	25½	Jan. 15	31½	751,665
Greene Cananea	52⅜	37	56⅜	34	47	34	39½	58⅛	Nov. 6	38½	Jan. 17	44	112,189
Homestake Mining	124	116	135⅛	126½	131½ (*h*)	89	89	95	Nov. 13	68	June 28	95	3,095
Inspiration Con. Cop. (*c*)	47⅜	16⅜	74⅜	42⅜	66⅜	38	47½	58½	Oct. 18	41⅛	Dec. 26	46⅜	1,141,740
International Nickel v. tr. ctfs. (*f*)	223⅜	179⅜	56⅜	38⅛	47⅜	24½	30⅛	35	Nov. 7	27	Jan. 15	32½	564,772
Internat. Nickel pf. (*f*)	110	105⅜	111⅜	105	108	92	98	98	Mar. 15	88½	May 2	96½	2,236
Kennecott Copper (*g*)	59⅜	25	64⅛	40	50⅜	26	32⅜	41½	Nov. 12	29	Mar. 25	31⅜	837,065
Lackawanna Steel Co.	94⅜	28	107	64	103⅞	68	77⅜	91⅜	May 16	65⅜	Dec. 30	67	331,999
Miami Copper (*e*)	36⅜	17½	49⅜	33	43½	25	29½	33¼	Jan. 31	22½	Dec. 31	22⅜	208,520
National Lead Co.	70⅜	44	74⅜	57	63½	37⅞	47½	69⅜	Dec. 11	43½	Jan. 7	66	67,850
National Lead Co., pf.	115	104⅜	117½	111½	114	99	104	105½	May 18	99⅜	Mar. 2	104⅞	4,540
Nevada Con. Copper Co. (*e*)	17	11⅜	34⅜	15	26⅜	16	18⅜	21⅞	May 16	16½	Dec. 30	17	171,750
Ontario Silver Mining	12⅜	2	11⅜	5⅜	7¼	3⅜	5¼	13	June 17	4¼	Jan. 22	7¼	266,067
Pittsburgh Steel pf.	102½	74	106	93½	102	87	95	98	Jan. 10	90	Apr. 2	90	3,135
Quicksilver	5½	¼	6	2	3	¼	....	....	....	....	....	....	....
Quicksilver pf.	6¼	¼	8¼	3½	4½	¼	....	....	....	....	....	....	....
Ray Consolidated Copper (*d*)	27⅛	15¼	37	20	32⅜	19⅛	23¼	26½	May 16	19¼	Dec. 26	20¼	319,896
Republic Iron and Steel Co.	57¼	19	93	42	94½	60	79⅛	96	May 16	72⅜	Jan. 15	75¼	1,421,950
Republic Iron and Steel Co., pf.	112⅜	72	117	101	105⅞	89	92⅜	102½	Sept. 17	92⅜	Jan. 2	97	24,830
Shattuck Arizona Copper (*d*)	38	18⅜	40⅜	22	29⅜	15	16½	18½	Feb. 19	13	Dec. 31	13	42,120
Sloss-Sheffield Steel and Iron	66⅜	24	93⅜	37	74⅜	33½	40	71⅛	May 24	39	Jan. 24	50	99,525
Sloss-Sheffield Steel and Iron pf.	102	85	103⅜	91½	99	88⅛	81	93⅜	July 29	81	Feb. 28	90	1,950
Tennessee Cop. & Chem. (*g*)	....	....	19⅜	15⅜	19½	11	12⅞	21	July 6	12⅜	Dec. 28	13	328,165
United Alloy Steel (*g*)	....	....	....	....	49⅜	34½	37	44½	May 10	36⅜	Oct. 31	38½	100,550
U. S. Smelt., Ref. & Min. (*a*)	....	....	81⅞	57	67⅞	40	45½	50⅜	Oct. 19	36	Apr. 13	45⅜	98,400
U. S. Smelt., Ref. & Min. pf. (*a*)	....	....	53⅜	50	52⅜	43⅜	45	47¼	Dec. 13	42⅜	Apr. 12	47⅛	6,970
U. S. Steel Corporation	89⅛	38	129⅜	79⅜	136⅜	79⅜	91⅜	116½	Aug. 28	86½	Mar. 25	95	31,853,040
U. S. Steel Corporation pf.	117	102	123	115	121½	102⅜	109	113⅜	Dec. 31	108	Mar. 25	113⅜	152,206
Utah Copper (*d*)	81⅜	48⅜	130	74⅜	118⅜	70½	81½	93	Oct. 19	71½	Dec. 26	73⅜	634,820
Vulcan Detinning	19	5	10⅜	7	10⅛	6	8⅛	10⅜	Dec. 26	7⅜	Apr. 3	10⅜	838
Vulcan Detinning pf.	43	21	26⅛	20⅛	24⅛	20	25	42	Sept. 5	25	Mar. 11	42	700

Highest and lowest prices of the year are based usually on sales of 100 shares. (*a*) Par $50. (*b*) Par $25. (*c*) Par $20. (*d*) Par $10. (*e*) Par $5. (*f*) Par value of common stock reduced from $100 to $25 in 1916; in 1917, voting trust certificates were exchanged for stock. (*g*) No par value. (*h*) Ex-dividend.

MINING STOCKS ON THE NEW YORK CURB—1918

Sales	Company	Open	High	Low	Last	Sales	Company	Open	High	Low	Last
412925	American Tin and Tungsten	⅜	⅜	⅜	⅜	283800	Consolidated Arizona Smelting	1⅜	2⅛	1 7/16	1 7/16
74300	Arizona Binghampton Copper	5⅜	6	3⅜	4	321650	Consolidated Copper Mines	6⅜	7⅛	4⅛	6⅛
62700	Aurora Silver Mines	2⅛	6⅛	2⅛	5	229450	Cresson Gold	4⅛	6	4⅛	5
1141678	Big Ledge Copper	1⅛	1⅛	⅛	1/16	700	Davis Daly	5⅛	5⅛	5⅛	5⅛
3514150	Boston Montana	†45	96	38	53	96685	Denbigh Mine	2	2⅛	⅛	⅛
90020	Bradshaw Copper	1⅛	1⅛	⅛	⅛	7440	Dome Extension	†12	14	12	14
4600	Buffalo Mines	⅛	1⅛	⅛	1	20715	Dundee Arizona Copper	⅛	1 1/16	⅞	1⅛
1055200	Butte-Detroit	1/16	⅛	† 2	2⅛	800	East Butte	10⅛	10⅛	9⅛	10
21075	Butte-New York	1/16	1⅛	⅛	⅛	480732	El Salvador Silver	†55	1⅛	†55	1⅛
66200	Butte Copper and Zinc	6⅛	10⅛	6⅛	11	1196445	Emma Copper	1/16	⅛	†11	12
1700350	Caledonia Mining	†46	56	23	29	3121	First National Copper	2⅛	2⅛	1⅛	2
1044400	Calumet & Jerome	1 1/16	1⅛	⅛	1/16	279800	Goldfield Consolidated	1/16	1/16	†17	23
206900	Canada Copper	2	2⅛	1⅛	2 1/16	407800	Gold Merger	† 3⅛	11	1⅛	6
423300	Candelaria Silver	†37	53	37	53	9500	Great Verde Extension Copper	1/16	1	1/16	1
1482700	Cashboy	† 4	19	3	8	219632	Hecla Mining	4⅛	6 1/16	2⅛	4⅛
509200	Cerbat S. M. and M.	†46	1⅛	†42	1⅛	8030	Howe Sound, w. i.	4⅛	4⅛	3⅛	4
9400	Cerro Gordo Mining	1⅛	1⅛	⅛	1	1014000	Hypotheek Mining and Milling	†16	35	12	12

Sales	Company	Open	High	Low	Last
57670	Iron Blossom	⅜	1⅛	7/16	15/16
243650	Jerome Verde	⅜	½	⅜	⅜
603875	Jim Butler	†78	90	32	35
87460	Josevig-Kennecott	1/16	7/16	1/16	1/16
343650	Jumbo Extension	†15	24	8½	13
14225	Kerr Lake	5	6	5	5½
262550	Kewanas	† 6	10½	1½	7
112450	La Rose Consolidated	¼	⅛	¼	¼
145900	Louisiana Consolidated	⅜	⅜	⅜	⅜
8400	MacNamara Mining	33	34	32	33
126900	McKinley-Darragh	55	60	38	48
113730	Magma Chief	1/16	⅜	¼	1/16
58085	Magma Copper	42	42	23	26
420000	Marsh Mining	† 6	8½	2½	4½
81070	Mason Valley	5½	6½	2½	2½
2900	Mines of America	1½	1½	¾	¾
22100	Mogul Mining	†35	35	10	15
47700	Mohican Copper	¼	⅜	¼	⅜
1611800	Mother Lode	†27	56	25	35
691800	National Zinc and Lead	†28	38	7	11
83050	New Cornelia	15½	19⅜	15½	18
3300	New York & Honduras Rosario Mining	12½	14	11r	12
52300	Nipissing	8⅜	9½	8	9½
141495	Nixon Nevada	1⅛	1⅛	+31	+43
496800	Ohio Copper, new, w. i.	1⅛	1 1/16	⅜	⅜
934280	Onondaga Mines	2	6	1½	4½
638600	Pacific Tungsten	1¼	2½	1⅛	1¼
106800	Portland Consolidated Copper	†33	34	30	32
163300	Ray Hercules	3¾	4¼	3	3½
2500	Red Hill Florence	4½	4½	4	4
76150	Red Warrior Mining	⅛	⅛	⅛	⅛
333200	Rex Consolidated Mining	†10½	15	7½	8
704200	Rochester Mines	†30	54	27	27
8800	Santa Fe Copper	¾	¼	¾	1¼
48600	Seneca Copper Corporation	7½	16	7½	15½
122450	Senorito Copper	¼	1	¼	½
210680	Standard Silver Lead	7/16	11/16	3/16	½
676700	Stewart	¼	¼	†10	16
607400	Success Mining	† 9	16	7	7½
26545	Superior Copper	2	3¼	2	3
19695	Tonopah Belmont	3	3⅜	2	2 3/16
1700	Tonopah Divide	1⅛	2 1/16	1⅛	2
349075	Tonopah Extension	1¼	2⅛	1	2 1/16
10235	Tonopah Mining	4	4	2 5/16	3
70520	Tri-Bullion	¼	7/16	¼	¼
230011	Troy-Arizona	†15	29	8	10
5000	Tintic Mining	¼	¼	¼	7/16
20225	United Eastern	4	5¼	3	4⅛
635605	U. S. Zinc and Lead	† 9	60	6	9
65700	United Verde Extension	36⅛	42	32	39
31500	Utica Mines	†11	12	9	10
1500	Verde Combination Copper	⅜	⅜	⅜	1⅛
498800	West End Consolidated	†69	1½	†65	1½
974640	White Caps Manhattan	†12	½	† 8½	10½
162400	White Caps Extension	†10	18	1½	2
105900	Wilbert Copper	†17	17	4	5
18100	Yukon Gold Mines	1⅛	2	7/16	1⅛

† Cents per share.

Bonds on New York Stock Exchange

	1917 High	1917 Low	1918 High	1918 Low	1918 Last	Sales in $1000
Alaska Gold M., 6% conv., '25, Series A	85	14	39	18	32½	188
Alaska Gold M., 6% conv., '26, Series B	84¼	14	36	18	32	305
Am. Sm. & Ref., 1st 30-yr. 5's, Series A, 1947	92⅛	84	95⅛	84⅛	92	1,682
Beth. Steel, 1st ext. 5's, 1926	104	93⅛	99	92	95⅛	317
Beth. Steel, 1st and ref. 5's, 1942	102	86⅛	93⅛	86	87⅛	480
Braden Copper, coll. tr. 6's, 1931	98	89	96¼	89¼	96	892
Cerro de Pasco, 10-yr. conv. 6's, 1925	118	100⅛	(a)	(a)	(a)	(a)
Chile Copper, conv. 7's, 1923	132	96¼	118⅛	102⅛	108	1,643⅛
Chile Copper, conv. 6's, 1932	101	70	89⅛	77	84	468
Chile Copper, conv. 6's, 1932 full paid	100⅛	80	....	....	....	.....
Chile Copper, coll. tr. 6's, 1932	....	....	89⅛	73	83	853⅛
Granby Consol., conv. 6's, '28	109⅛	94¼	100	91	98	88
Granby Consol., stamped	109⅛	96⅛	97	91	97	107
Colo. Fuel & Iron, gen. s.f.g., 5's, 1948	97⅛	81⅛	86¼	83	86¼	54
Illinois Steel, deb. 4½'s, 1940	94	81	86⅛	81	83⅛	506
Indiana Steel, 1st mtg., 5's, 1952	103⅛	94⅛	99	92	97½	487
Lacka. Steel, 1st conv. 5's, 1923	101⅛	95	97	94½	96	358
Lacka. Steel, 1st conv. mtg. 5's, Series A, 1950	107½	83⅞	96⅛	83⅛	84⅛	688
Mex. Petrol, 1st and ref. conv. 10-yr. s.f. 6's, series A, 1921	111	100	181⅛	105⅛	165	57
Mex. Petrol, 1st and ref. conv. 10-yr. s.f. 6's, series C, 1921	110⅛	100	175	106	163⅛	126
Nat'l Tube, 1st mtge. 5's, 1952	103	94⅛	97⅛	93	95⅛	76
Republic I. & S. 10-30-yr. s. f. 5's, 1940	101½	93⅛	98½	91	91	452
Tenn. C. I. & R.R., 1st 5's, 1951	103⅛	95	97⅛	92⅛	95½	101
Tenn. Copper, 1st conv. 6's, 1925	101½	87⅛	95⅛	88	91	82
U. S. Sm., Ref. & M., conv., 6's, 1926	109	94⅛	100	92⅛	99⅛	397
U. S. Steel, 10-60 yr., s. f. 1963	107⅛	93½	101	96	99⅛	8,038
U. S. Steel, 10-60 yr., s. f. 5's, 1963, registered	107	92½	100⅛	96	98⅛	78
Va. Iron C. & C., 1st 5's, 1949	90	85	86⅛	83	86⅛	61

(a) Entire issue called for redemption, May, 1 1918.

MINING STOCKS ON BOSTON EXCHANGE, 1918

	High	Date	Low	Date	Last
Adventure	1⅛	Jan. 25	⅛	June 27	60c.
Ahmeek	86	Nov. 12	69	Dec. 27	70
Algomah	45c.	May 13	15c.	July 11	20c.
Alloues	54	Feb. 27	41½	Dec. 31	41½
Arizona Commercial	16½	Aug. 24	11	Jan. 5	12½
Butte Ballaklava	48c.	Nov. 22	20c.	Oct. 21	30c.
Calumet & Arizona	73½	May 16	61	Dec. 27	61
Calumet & Hecla	470	Dec. 4	425	Dec. 26	430
Centennial	14½	Feb. 19	10¾	June 27	13
Copper Range	51½	Nov. 12	40	Dec. 26	41½
Daly West	3	Sept. 30	1½	Apr. 10	2⅜
Davis Daly	6⅞	Mar. 8	4⅜	Dec. 23	5
East Butte	12	Nov. 12	8½	Mar. 25	9⅜
Franklin	6	Feb. 18	3	June 21	3½
Hancock	10½	Jan. 2	4⅜	Dec. 31	5
Indiana	1	Jan. 3	40c.	July 23	60c.
Island Creek	70	May 15	45½	Dec. 27	46
Island Creek, pfd	84	Feb. 18	79½	Oct. 1	79¾
Isle Royale	29	July 3	19½	Jan. 14	24
Kerr Lake	6½	Oct. 18	5	Jan. 2	5½
Keweenaw	1⅞	May 15	80c.	Sept. 11	95c.
Lake	8⅛	May 14	4½	Dec. 27	4½
La Salle	3½	Mar. 5	2	Jan. 2	3
Mason Valley	6	Feb. 13	2⅜	Dec. 27	2½
Mass Consolidated	7	Jan. 2	3¾	Sept. 17	4½
Mayflower-Old Colony	4½	Nov. 4	65c.	Mar. 26	2½
Michigan	4½	Oct. 29	40c.	June 28	2½
Mohawk	66½	May 16	51	Dec. 26	52
New Arcadian	2½	July 1	1½	Aug. 29	1⅝
New Idria	17¼	Mar. 7	9¾	Dec. 27	10
Nipissing	9⅞	Apr. 11	8 7/16	Jan. 11	9
North Butte	17⅜	May 16	10½	Dec. 30	10⅜
North Lake	95c.	Mar. 19	½	Feb. 14	55c.
Ojibway	1⅜	Dec. 10	½	June 21	1⅜
Old Dominion	45½	Jan. 3	33	Dec. 24	35
Osceola	65	Jan. 9	46½	June 11	48
Quincy	78	May 16	59	Dec. 27	60
St. Mary's	57	Jan. 2	38	Dec. 27	40
Santa Fe	1½	Feb. 21	½	Dec. 12	32c.
Shannon	5¾	Jan. 2	3	Apr. 10	3
South Lake	2	Jan. 3	½	Sept. 30	1⅜
So. Utah M. & S.	20c.	Jan. 8	10c.	Dec. 30	10c.
Superior	8⅛	Nov. 20	4	Feb. 19	5¼
Superior & Boston	4⅜	Sept. 27	1½	Aug. 13	3
Trinity	4½	Feb. 13	2½	Sept. 23	2½
Tuolumne	1⅛	Aug. 20	73c.	Dec. 27	77c.
Utah Apex	4½	Nov. 18	1½	May 31	2⅛
Utah Consolidated	12	Jan. 16	7½	Dec. 27	8
Utah Metal and Tunnel	3 3/16	Apr. 8	1	Dec. 9	1⅛
Victoria	3	Jan. 3	1⅛	Dec. 30	2
Winona	2	Jan. 3	½	Nov. 21	85c.
Wolverine	36	Jan. 3	18	Dec. 16	18½
Wyandot	1 1/16	Mar. 7	40c.	May 19	50c.

Hoover Talks Bluntly

Hoover's friends know how deeply he feels and how straightforwardly he speaks. They can readily appreciate his attitude when recently the Baron von der Lancken and Dr. Reith, who were prominent in the German administration of Belgium, telegraphed from Berlin to Walter Lyman Brown, Director of the Commission for Relief in Belgium, at Rotterdam, that they had been appointed by the German government to negotiate with Hoover for food supplies, and that they desired Mr. Hoover to advise them as to when and where he would meet them.

In answer to the request for a conference, Mr. Hoover sent this message to Mr. Brown:

"You can describe two and a half years of arrogance toward ourselves and cruelty to the Belgians in any language you may select, and tell the pair personally to go to hell, with my compliments. If I have to deal with Germans, it will not be with that pair."

It was to Baron von der Lancken that Brand Whitlock, American Minister to Belgium, vainly appealed to intercede for Miss Edith Cavell, the English nurse who was executed by the Germans on the charge of "treachery." The designation of that pair by the Berlin government to negotiate with Hoover shows that, whether autocratic or democratic, it is unable to appreciate the fitness of things.

Industrial News from Washington

By Paul Wooton, Special Correspondent

New War-Minerals Bill Introduced

Bills authorizing the Secretary of the Interior "to determine, adjust, and pay losses sustained by investment preparatory to production of war minerals" have been introduced in Congress. The Senate bill was introduced by Senator Henderson. Identical bills have been introduced by several members of the lower house.

The bill provides that the cost of the investigation of the subject and the payment of claims are to be taken from the money appropriated by the War-Minerals Act, and, "that said funds and appropriations shall continue to be available for said purposes until such time as the Secretary shall have fully exercised the authority hereby granted and has performed and completed the duties hereby provided and imposed."

The Secretary is directed to determine the losses sustained in efforts to produce war minerals "to supply the urgent, published and evident needs of the Nation during the war." The bill allows a wide range to claimants, as it covers "money heretofore invested or contracted to be invested and obligations incurred by any and all persons and investors for producing, or for the purpose of producing or preparing for producing or acquiring property for producing," the war minerals within the United States.

The action of the Secretary is to be final. He is instructed to consider claims having a basis on moral, equitable, and just grounds. The full text of the bill follows:

A bill to supplement an act of Congress approved Oct. 5, 1918, (public numbered 220), and to authorize the Secretary of the Interior, from the funds appropriated by said act, to determine, adjust, and pay losses sustained by investments preparatory to production of war minerals mentioned in said act.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Interior be, and hereby is, authorized and directed to ascertain and determine the amount or amounts of money heretofore invested or contracted to be invested and obligations incurred by any and all persons and investors for producing, or for the purpose of producing or preparing for producing or acquiring property for producing, within the United States, to supply the urgent, published, and evident needs of the Nation during the war, any ores, metals, minerals, or mineral substances mentioned and enumerated in an act of Congress approved Oct. 5, 1918 (public numbered 220), entitled "An act to provide further for the national security and defense by encouraging the production, conserving the supply, and controlling the distribution of those ores, metals, and minerals which have formerly been largely imported, or of which there is or may be an inadequate supply"; and that said Secretary ascertain, determine, adjust, liquidate, and out of the moneys provided and appropriated by said act, pay to the parties entitled thereto the amount of such losses and damages as he, the said Secretary, shall find and determine have been sustained and suffered or are likely to be sustained and suffered, by reason of having made such investments for said purposes or having produced surplus stocks of such materials; and that in each case he shall make such determination, provision, settlement, advancement, or final payment, and by agreement with owners and claimants make such other adjustment or take such other action as he shall find and determine to be just, equitable, reasonable, and expedient; and that he make such provisions as he may deem necessary, advisable, and reasonable to prevent further losses pending final decision, settlement, and disposition in any case or cases; that the payments herein authorized be made to the claimant or claimants the said Secretary shall find to be morally, equitably, and justly entitled thereto: that in ascertaining and determining the losses and damages sustained or to be sustained, and the adjustments, settlements, payments, and provisions to be made, the said Secretary shall consider the prices and conditions existing at the time of each investment and the prices and conditions existing prior to the war, as well as those existing at the time of such determination, adjustment, and settlement, together with all of the circumstances and conditions of each case; that the final determination, decision, provision, disposition, and action of said Secretary in each case shall be conclusive and final; that all payments shall be made and all expenses incurred by the Secretary paid from the funds and appropriations provided and appropriated by said act of Oct. 5, 1918 (public numbered 220), and that said funds and appropriations shall continue to be available for said purposes until such time as the said Secretary shall have fully exercised the authority hereby granted and performed and completed the duties hereby provided and imposed.

Sec. 2. That a report of all operations under this act, including receipts and disbursements, shall be made to Congress on or before the first Monday in December of each year.

Sec. 3. That nothing in this act shall be construed to confer jurisdiction upon any court to entertain a suit against the United States.

Bastin Heads Reorganized Division

An important reorganization of the mineral-resources division of the U. S. Geological Survey is in progress. Edson S. Bastin has been appointed to take charge of a reformed and extended division. In explaining the need for the change, Director George Otis Smith said:

The pre-war activities of the Survey now must be expanded so as to include: the collection of more complete statistics bearing upon domestic consumption, supplementing the figures that show domestic production with more data regarding stocks and imports and exports; the quarterly and monthly publication of statistical returns, thus making the current statistics valuable as industrial guides as well as historical records; the study of the international movement of mineral raw materials, as bearing upon the domestic industry; and the investigation of the extent of the world supply of minerals, the world view being essential to the home industry, for it is no longer enough to know simply what are the mineral resources of the United States. Full development of all these lines of inquiry will necessitate complete coöperation with other bureaus and departments and larger utilization of the Survey's own resources of scientific personnel.

The division will include four sections—metals, non-metals other than fuels, mineral fuels, and foreign reserves. G. F. Laughlin will be the geologist in charge of the metal section; R. W. Stone the geologist in charge of the non-metals section; C. E. Lesher the geologist in charge of the mineral-fuels section, and J. B. Umpleby the geologist in charge of the foreign-reserves section.

H. D. McCaskey, who has had charge of the division of mineral resources for many years, continued that administrative work at considerable personal sacrifice during the war, but declined to ask for relief until the emergency had passed. In the future, he will devote his time to the study of special phases of mineral resources which he has not been able to undertake comprehensively, owing to the burden of administrative work.

Mr. Bastin, the new chief of the division, was born in Chicago in 1878. He was graduated from the University of Michigan in 1902 and received his technical training at the University of Chicago. He began his work with the Geological Survey in 1904. In 1913 and in 1914, however, he returned to the University of Chi-

cago as lecturer on economic geology. He then again took up his work with the Survey. His field work on economic geology has been confined largely to the Breckenridge, Gilpin County, Boulder County, Clearfield County, Ouray, Telluride, Red Mountain, San Juan and Aspen districts of Colorado; Patagonia, Pierce, Wickenburg, Kingman, and Chloride districts in Arizona; and the Tonopah and Virginia City regions in Nevada. In September, 1916, Mr. Bastin went to Chile to make a special geological report on the mines of the Braden Copper Co. This occupied a year. On his return, he was retained for several months as lecturer on mining geology at the Massachusetts Institute of Technology. Since the beginning of the war, he has acted as secretary of the departmental committee on war minerals and their derivatives. Up to the close of 1918, he was in charge of the mineral bureau of the War Trade Board.

May Delay War-Minerals Relief

Pending the outcome of the present controversy, which deals chiefly with War Department agreements and contracts, it is not probable that the Henderson bill providing for the relief of producers of war minerals will be pushed. After the Senate had given some evidences of regarding the Hitchcock bill with favor, the measure apparently has received its quietus at the hands of Benedict Crowell, the Assistant Secretary of War. In a communication to Senator Fletcher, Secretary Crowell said:

The Hitchcock bill provides for the establishment of an Adjustment Commission of three members, who shall decide all cases of cancellation of existing valid contracts or orders of the War Department, and also all cases in which a contract was not made or signed as provided by law.

The War Department is strongly convinced that the enactment of this bill would cause great and unjustifiable delay in settling the proper claims of contractors and would most unjustly throw hundreds of contractors into bankruptcy.

It would first be necessary for the President to appoint the members of the commission. The Senate must then confirm the appointments. Thereafter the board must organize and familiarize itself with its duties. If regional boards of examiners are appointed, their membership must be selected and their machinery started.

These various steps will necessarily take time. After they have been performed, the board will find itself confronted with a situation which will absolutely prevent prompt settlements. This situation will result both from the magnitude of the task and from the almost total lack of assistance provided for the board in the bill.

Incomplete figures show that the total number of settlements which would come before the board would exceed 25,000. That this is an impossible task for three men in one year is, of course, obvious.

Your attention is invited to the fact that the entire appropriation provided by the bill is only $50,000; that $35,000 of this amount will be used to pay the salaries of the three members of the board and the secretary; and that only $15,000 will be left for the accountants, investigators, clerical assistance and office expenses of the central board and the entire expenses of all such boards of examiners as may be appointed. Comment on the utter inadequacy of such an appropriation is unnecessary. At the very outset, the board would be choked with work, and this condition would become hopelessly more aggravated each succeeding week.

In addition to being utterly unable to do its work, the Adjustment Board provided by S. 5261 is entirely unnecessary, for the reason that the War Department already has established and at work a machinery adequate to handle efficiently and promptly all settlements. Without now going into the details, the department has a central board of contract review in each of the eight supply bureaus in Washington; also a total of 24 local or district boards in various sections of the country making settlements for the Ordnance Department and the former Quartermaster Corps. The department has also established in Washington a Board of Contract Adjustment to which the Secretary of War refers for decision all cases in which the contractor and the contracting officer are unable to agree. Furthermore, several thousand contracting officers, accountants, investigators and other assistants are now at work helping the boards to make prompt settlements. On the enactment of the legislation which the War Department has requested, this machinery is prepared to start immediately on the cases in which contracts were not made or signed as provided by law.

The War Department feels very earnestly that the good faith of the Government is pledged to a prompt settlement and payment of all just claims of contractors. The department stands fully ready to make such settlements, and is already doing so where the contracts were made and signed as provided by law.

The Dent bill, as amended by the House Committee on Military Affairs, will meet the requirements of the situation if amended in a few further respects as suggested by the War Department and will enable the department to utilize its existing boards and its existing personnel to make prompt settlements of all formal and informal contracts.

Cannot Import Potash for Months

Edward N. Hurley's statement given to the press in Paris that all returning American ships would carry potash from Alsace caused domestic producers to protest strongly. This led Senator Hitchcock, of Nebraska, to investigate the matter. His comment on the subject made on the floor of the Senate is in part as follows:

For the present, it is the intention of the War Trade Board not to allow the importation of potash until the peace treaty is signed, for the reason that the potash industry has been encouraged by Government agents during the war to go to an extraordinary expense in the development and production of potash, and a large supply of potash is now on hand. The fertilizer companies are refusing to buy this potash in the hope of being able to import potash from Europe to put into fertilizers during the present season. This is utterly impossible. During this season it is holding out a false hope to the agriculturists who are depending on fertilizers; potash cannot be imported for months yet to come. The order of the War Trade Board still stands, and the War Trade Board has taken occasion to send to Mr. Hurley information that that order still holds good. It would be, in effect, a breach of faith on the part of the Government, after encouraging the potash men, as a war industry, to produce the potash at this time and at great expense, now to make it impossible for the companies to market their product. I think that the fertilizer companies which are depending upon securing potash from Europe at this season for their fertilizers will find that they are anticipating something that is impossible.

I wish to say in this connection that I have introduced, and there is still upon the table of the Senate, a resolution which I may ask later to have considered, directing the Federal Trade Commission to inquire whether the fertilizer companies of this country have entered into a combination to refuse to buy this potash, whether those fertilizer companies have large interests in European potash mines, and whether or not European potash companies, notably those of Germany, have interests in the American fertilizer companies. I think that this is susceptible of some proof. There seems to be a combination at the present time of fertilizer companies to refuse to buy the American potash that has been produced at the urgent request and under the stimulation of the Government urging.

Platinum Supply To Remain Scant

Practically no platinum is in the hands of Russian banks, according to information reaching Washington. There is some in the hands of individuals in Russia, but this, it is believed, does not exceed 50,000 oz. All operations in Russia have ceased, and it is believed that two years must elapse before there can be any hope of enough production for it to be a factor.

Any decided easing off of the stringency in the metal is not expected by officials here. There is to be no scrapping of sulphuric-acid plants, so that little of the platinum being used as a catalyzer will be released. Some platinum has been allocated to plants not yet built, but that surplus and more probably will be demanded for nitric-acid plants. There is every reason to believe that the Government will carry out its plans for the production of nitrates.

Molybdenite in Norway

There are a number of deposits of molybdenite in Norway, the principal ones being situated near Flekkefjord, in the southern section of the Stavanger Amt, and the working of these deposits is the only mining of any importance carried on in this district, says *Commerçe Reports*. New mines are being opened and companies formed to exploit them. As yet there are no plants in Norway where the product molybdenite (MoS_2) can be converted into ferromolybdenum, and a market must be found abroad. Small quantities go to Sweden. To prevent molybdenite from reaching the Central Powers, where, it was reported, it is used extensively to manufacture quality steel, the British government made contracts for the purchase of almost the entire output of 1917. The price paid was high, $4.25 per lb., and caused much activity in the mining and reduction industry.

A company was formed to undertake the production of ferromolybdenum and other products of molybdenum. The plant is to be at Flekkefjord or Sandnes, where the raw material is convenient and water power obtainable. It is said that the company has acquired the patent rights for a process by which ferromolybdenum can be produced without the usual waste, which is from 20 to 30% of the molybdenite with ordinary processes. It is not known when the plant will be completed and ready for operation.

The Siberian Mines

Latest news from Russia, according to the *Statist*, is to the effect that the Siberian government is becoming stronger. Men of tried ability and honesty who refused to be connected with previous governments have now joined. All the properties of the group are free from Bolshevik influence, and preliminary resumption of operations is reported, in particular coal mining and production of lead, for both of which a good market exists in Siberia. Resumption of copper production on a large scale depends upon ability to obtain stores and materials, and upon improvement in transport conditions. Until the Bolshevik influence vanishes from Western Russia, and the railway outlets therefrom are available, big-scale operation under normal conditions can hardly be looked for.

No real damage has apparently been done to the Irtysh properties, and the managing director has recently telegraphed that the position is promising. In regard to Kyshtim, it has not been possible to prepare the accounts of the Russian companies for 1916-17, but the blister copper output is known to have been about 5000 tons in the latter year, against 6392 tons in the former. The Tanalyk's production of blister copper is placed at about 700 tons for 1917, against 687 tons in 1916. The plants have been shut down since the beginning of 1918.

Mining in German East Africa

The principal mining group in the protectorate of German East Africa, according to extracts from the British *Board of Trade Journal*, printed in *Commerce Reports* of Jan. 2, consisted of the Centralafrikanische Seen Gesellschaft (Central African Lakes Co.), the Centralafrikanische Bergwerks Gesellschaft, the Kironda Goldminen Gesellschaft, and the Irangi Syndikat. The second company was an offspring of the first named and the third an offspring of the second. The Irangi Syndikat was founded in 1896 by the Diskonto Gesellschaft and the Norddeutsche Bank of Hamburg.

The parent mining company, the Central African Lakes, founded in Berlin in 1902, was itself chiefly concerned with the salt works at Gothorp, and from 1910 onward paid a steady 8% dividend. The Lakes company's gold mining claims were represented by an interest in the subsidiary Bergwerks Company (1905), which, in its turn, made over its rights in the Schenkwe gold fields to the Kironda Gold Mining Co. The original holding of the Lakes company in the Bergwerks concern was one-half, but the proportion appears to have been since reduced.

The Bergwerks and the Irangi Syndikat each held a one-fifth interest in the Kironda company, founded in 1908, of which the capital was 1,250,000 marks. The Kironda company produced nearly 1,000,000 marks' worth of gold in 1911 and made 224,000 marks' profit but afterward did less well. Gold mining in the protectorate was upon a very small scale in comparison with the industry in British South Africa.

Resume the Gold Standard

The London cables announce that the committee on financial facilities for after-war trade has completed its preliminary report. It recommends the resumption as soon as possible of the gold standard and reducing inflation caused by short-time government borrowing of the banks. Resumption of the gold standard in England means exactly what it means in the United States, says the *Tribune*. It does not mean that there has ever been in England during the war any definite gold premium or depreciated paper currency, any more than there has been any gold premium or depreciated currency in the United States. Both countries, while remaining nominally upon a gold basis, had actually stopped free payments in gold, and were therefore actually upon a paper basis. The paper in England was treasury notes, bank notes and bank credits. The paper in the United States was chiefly Federal Reserve notes and bank credits. England proposes now to "resume" by annulling her embargo upon gold exports. The United States should do the same, promptly and without further hesitation.

A Plea for Common Honesty

The *Wall Street Journal* says: "Let it be supposed that a private company, the U. S. Steel Corporation, for example, should, because of inefficient bookkeeping, neglect to pay wages for several months. In such an altogether impossible contingency everyone knows what the result would be. The company, in fact, could not hold up wages even for a few hours without risking a strike.

"But the U. S. Government is doing exactly that thing with the soldier. Not only are his wages in arrears, but those dependent upon him have not received punctually, to put it mildly, what was guaranteed when the soldier was drafted. He has not the recourse of the

Steel employee, because he cannot strike. But is it common honesty to subject him to a privation so serious as this?

"There is a growing and dangerous feeling in Washington that the U. S. Government can be guilty of acts of tyranny, neglect, and flat dishonesty which would not be tolerated in private corporations and would be personally abhorrent to members of Congress who are willing, by indifference or even pernicious activity, to encourage such government. Is there anything recorded in the relation of corporations to those whom they serve more shamelessly dishonest than that of the postoffice to the railroads in the transmission of mail? The abuse of the contract is notorious, and the politician thinks it upon the whole rather clever to cheat the property holder in railroads out of his just due for service performed."

How Is Germany Going To Pay?

How to get blood out of the German stone is the question that is worrying not a few of our Allies, remarks the *Evening Post*. An even more startling problem is how to take wealth from Germany without ruining ourselves by it. Sir Eric Geddes, First Lord of the British Admiralty, says that a German indemnity must be paid in gold, goods, or labor. But Germany has no gold; and "if we received the indemnity in goods it would stagnate our production and labor market." And thus Mr. Lloyd George: "Germany ought to pay; she must pay as far as she can, but we are not going to allow her to pay in such a way as to wreck our industries." And if Germany is made to pay, it might unduly stimulate her manufactures and export trade! Horrible predicament!

A way out is suggested by Sidney Low in a letter to the London *Times*. Goods and labor are not Germany's only assets. She has immense natural resources. "Her iron fields and coal mines, even after the cessation of French Lorraine, will still be among the richest in Europe; she has copper, lead, zinc, and silver; and potash deposits of unique importance." Authoritative estimates place the gross value of Germany's mineral resources as high as 1000 billion dollars, and even more; and the Ruhr basin mines alone are said to be worth 225 billions. Mr. Low's proposal is that the Allied governments require Germany to surrender to them the usance of such of her mines and mineral deposits as would yield from 500 to 1000 millions annually for the next 30, 40, or 50 years. It is a gorgeous proposal.

Bulletin Discusses Gold Situation

WASHINGTON CORRESPONDENCE

The forthcoming issue of the Federal Reserve Board's bulletin will contain a discussion of the present gold situation of the world. It is pointed out that the restoration of the free gold market under proper conditions at as early a date as may be feasible is strongly to be desired. Some of the problems in this connection are discussed. During the month ended Dec. 10, gold imports, it is stated, amounted to $2,412,000, coming largely from Mexico, Canada, and Portuguese Africa. Gold exports during the same period totaled $1,132,000. The latter were consigned chiefly to Chile and to Mexico. The gain in the nation's stock of gold since Aug. 1, 1914, is shown by the following table:

GOLD IMPORTS AND EXPORTS
(000 omitted)

	Imports	Exports	Excess Imports Over Exports
Aug. 1 to Dec. 31, 1914	$23,253	$104,972	(1) $81,719
Jan. 1 to Dec. 31, 1915	451,955	31,426	420,529
Jan. 1 to Dec. 31, 1916	685,745	155,793	529,952
Jan. 1 to Dec. 31, 1917	553,713	373,171	181,542
Jan. 1 to Dec. 10, 1918	61,066	39,701	21,342
Totals	$1,775,732	$704,063	$1,071,669

(1) Excess of exports over imports.

Only a portion of the information to be contained in the article was allowed to become available. It will include elaborate tabulations, showing the present gold position of the world.

Mining Congress Forms New Division

The war-minerals division of the American Mining Congress has been formally organized and the following executive committee elected: A. J. Edwards, Batesville, Ark., chairman (manganese); Howard F. Wierum, Valley, Wash., vice-chairman (magnesite); Nelson Franklin, Denver, Colo. (chrome); W. L. Gazzam, Seattle, Wash. (chrome); Courtney DeKalb, San Francisco (chrome); Nathaniel P. Pratt, Atlanta, Ga. (pyrites); J. J. Jensen, Salt Lake City, Utah (pyrites); W. W. Pettis, Phillipsburg, Mont. (manganese); and John T. Burns, Washington, D. C., secretary. All producers interested in the minerals and metals named in the War-Minerals Bill have been asked to join the new division of the congress.

Miners Built Good Bridges

The boys of the 27th proved that mining furnishes a good all-around experience for nearly every kind of engineering work. So stated Lieut. Col. O. B. Perry in a recent letter, in which he described the work the regiment had accomplished. "After they got going," he said, "they handled the bridge work as creditably as any organization could have done that was specially trained for the work. They also proved their ability in dugout construction and had officers coming from all around to see how the work should be done."

In referring to the Comfort Fund, Colonel Perry said, "I have seen men go without food, and work for 24 hours straight, or longer, in the rain and cold, without a grumble; and the same men will get grouchy and dissatisfied if they do not have tobacco or sugar for their coffee."

Contributions are still arriving for the Fund, the last one coming from Alaska, and the one before it from Chile. Geography has cut no figure where the mining regiment was concerned.

HOW THE COMFORT FUND STANDS

Previously acknowledged	$19,653.56
W. E. Defty	10.00
Alaska Mining and Engineering Society	111.00
W. H. Corbould	6.50
Dover Laboratory	2.00
Interest to Jan. 1, 1919	105.30
Total	$19,888.36

Checks should be made payable to W. R. Ingalls, treasurer of the Association of the 27th Engineers. Because of the work involved in administering the Comfort Fund, contributions are acknowledged only by publication in the *Journal*.

Editorials

What About Copper?

FROM Dec. 1 to 31 no copper was sold by producers, who were in agreement among themselves not to sell any for less than 26c., which nobody would pay. Just before the end of the year it was signified that 23c. would be the export price, and it was intimated that the same would be asked for domestic business. On Jan. 2 some of the small producers began to sell copper at 21@20c. Their total sales up to date have been probably not more than 15,000,000 lb., which is a mere bagatelle in comparison with what has to be sold ordinarily in order to dispose of the American output. The large producers have made no unqualified sales. Last week they said they would sell at 23c. and guarantee that price against themselves, i.e. if A. B. sold copper to C. D. at 23c. and before delivery was made he should sell E. F. at 20c., then C. D.'s copper would be billed to him at 20c., not 23c.; but the sale of copper by other producers would not modify A. B.'s contracts. We believe that the above is a correct statement of facts so far as things have yet developed. We may add, however, that the British government is offering its accumulation of electrolytic copper at £105, to meet which price producers would have to sell here at an equivalent that is variously reckoned at 18½@19c. Furthermore, that standard copper is quoted in London at a considerably lower price.

Before passing into the field of opinion, we may mention, also, that the foreign governments have put obstacles in the way of the transportation of metals to their countries, and American producers temporarily are deprived of a European outlet. This is true not only of copper but also of zinc and lead. Sellers who have tried to feel those markets have run up against a blind wall, which they cannot describe exactly, but respecting the existence of which they have no doubt. In the meanwhile, American consumers have professed an absence of interest. The few who really needed a little copper could get it from sellers at 20 cent.

With the situation that has thus developed there cannot be said to be any copper market in the major sense, for an average of one million pounds per day does not cut much of a figure in comparison with the eight million that ought to be sold daily. Nor is there any free offering, any general effort to make a market. It can neither be said that copper is offered in volume at 20c., nor that consumers could obtain it at that price if they wanted to buy it liberally. Indications of any such desire on their part would probably cause the small producers to raise their prices. The dominant feature is that there is no real market, owing to the big producers being out of it. We do not think the big producers are holding aloof with intention of enforcing an arbitrary price nor that they are acting in collusion. They are probably swayed, however, by a reluctance to force copper in a market wherein but few buyers are yet intimating any interest.

Aid for War-Minerals Producers

ON DEC. 15 Senator Henderson introduced a bill in the Senate for the relief of mines and miners who have suffered through the production or contemplated production of the so-called war minerals. This bill appears in full upon another page of this issue.

We have two particular criticisms to make of the proposed measure. If its enaction is necessary or strongly advisable, its provisions should be broad enough to cover all other producers who have suffered through our participation in the war, not yet provided for by previous legislation. The amendment in its present form should have a title reading somewhat as follows: "A bill to create endless work for the Interior Department, and a cemetery for the blasted hopes of those who, at one time, classed themselves as patriots."

There have been losses among miners who can ill afford them, and there will be discomfort and perhaps suffering in their families owing to the fact that the war unexpectedly came to an end on Nov. 11. But miners of the metals and substances mentioned in the original bill to which this is an amendment are no greater sufferers than the thousands of others who were producing or attempting to produce raw and manufactured articles needed during the war period. Producers of food, such as the farmer and the gardener, have been fully protected by the law of supply and demand, now acting strongly in their favor. The farmer was further protected by the Government guarantee on his wheat. Manufacturers with Government contracts were also fairly well protected, but the millions of their employees and the dependents of those employees—the actual producers of the guns, ammunition, and clothing—are as keen sufferers as those who have put their small capital into mines or plants which are now idle. "Every man for himself and the devil take the hindmost" may be accepted as a good business maxim in some quarters, but if the miners can "put one over" on the rest of the people that circumstance will not in any degree indicate a desire to conform to or to promote correct business principles. As a matter of fact it is not good business, because it is not honest. We are not any harder hit than thousands who are not miners; we did not go into the business with the understanding that the Government was going to make good our losses if we failed. Few of us went into the business for patriotic reasons. We went after manganese and chrome ores because the prices for these ores were high, and we believed that we could get in and make money. We were certainly led to believe that the prices were going to stay high for a time through the information given out by the Government in respect to stocks, demands, and importation; and, had the war continued, some of us would have made good, though many would not have done so.

The Government certainly stimulated production, but it did so because it gave out all the information it

possessed, not through misrepresentation. Because ore resources somewhat exceeded expectations, and because the war came to an end before profits had equalled expenses, it is scarcely a square deal to the rest of the people who have to pay the bill to ask the Government to meet the losses.

There is another way of looking at this question of miners' losses. Let us honestly ask ourselves the question as to how much longer we would have liked this war to have gone on. There is not one good American —not one with real red blood in his veins ready to spill if demanded of him—but would say that he was glad to see it stop the day it did. What suffering may have resulted from its continuance we cannot guess, but the money equivalent, presuming that it could be measured in such terms, certainly would have reached many times that indicated by the cost of a manganese log washer. Our dose of medicine has been small compared with that accepted by those who have lost relatives dearer than life itself. Let us live up to our reputation of being men, and take our losses like men who play the game for what there is in it, and ask no favors at the table except that the cards be dealt fairly.

When it comes to the administration of the proposed law, the line of justice will be most difficult to discern, because all the wolves will be dressed in lambs' clothing. We do not wonder at Secretary Lane hesitating to take action with the authority of powers already delegated to him; and he and his department have our sincere sympathy if he is ultimately required to administer justice under the proposed amendment.

Some Views of Labor

It is important always to get many views. The New York *Sun* recently sent a representative to ascertain and report respecting the conditions in the important manufacturing and munitioning city of Bridgeport. He submitted an illuminating report. Among other things he mentioned a conversation with Sam Lavitt, business agent of the machinists' union.

"Cancellation of war contracts," said Mr. Lavitt, "has practically closed the small shops, which laid off a majority of their men two or three weeks ago. These men can get other jobs, but won't take 'em."

"Why not?" the *Sun* reporter asked.

"Because the war standard of wages must be maintained," said Mr. Lavitt. "The manufacturers want to pay 65c. an hour to toolmakers who have been getting from 80 to 90c., and 45 or 50c. an hour to machinists who have been getting from 60 to 80c. The manufacturers are trying to break down the standard, and the men won't stand for it.

"We have a program that would prevent both wage cuts and lay-offs. That is, let the manufacturers continue to pay the same wages they have been paying and if necessary reduce the number of hours so that everybody could keep working at the old wages until we get adjusted to peace production and the hours could be increased. Suppose a factory has 1000 men and now has work for only 500. Instead of laying off 500 let it cut the working day from eight to four hours, and keep on that way until business picks up."

Mr. Lavitt's ideas reflected, of course, the ancient fallacy respecting the advantage of breaking window panes in order to make work for the glaziers. The general adoption of such ideas would turn civilization backward on the road leading from the condition when men lived in caves, wore the skins of animals and lived by trapping and fishing; from which state the civilized world has progressed slowly and painfully.

The people of the country paid the ransom demanded by the railroad brotherhoods. Mr. McAdoo, after he became Director-General of Railways, advanced wages some more, and then all around. It has been notorious, however, for some months that nobody was happy. The shippers of freight and the travelers were disgruntled by the increased costs to them, which were directly due to increased wages. But the recipients of the increased wages were even more unhappy. Things were all right so long as Mr. McAdoo did business only with the big brotherhoods; but when he undertook to improve the situation of everybody working on the railways he unbalanced the schedules. A man may be perfectly contented with his pay, but if he finds another man, whom he knows to be of inferior capacity and to be doing inferior work, getting just as much, or nearly as much, his contentment quickly vanishes. This is what happened on the railways.

It is shrewdly conjectured that one of the reasons for Mr. McAdoo's retirement is the mess that has been made of the railroad situation. The public is dissatisfied, and so are the employees. It was manifestly necessary to exercise considerable ingenuity to produce conditions that satisfy nobody.

The Journal Index

The Index for Vol. 106 will be issued sometime in February. Subscribers who wish a copy of the Index will please promptly notify the Subscription Department of the *Engineering and Mining Journal* by postcard.

When trade with Russia can be resumed, the American producers of metals should sell directly to the Russians. This would not merely save the European middleman's profit, but would also give the producers the enormous advantage of knowing as soon as the Germans, the English, and the French, what the demand in Russia is, and will be; and would, furthermore, preserve to American bottoms freight which heretofore has moved in foreign bottoms, principally German.

BY THE WAY

The New York *Times* stated on Jan. 8 that British capital is about to establish in Mexico a bank to be known as the Mineral Bank, which will make a specialty of loans on mining properties and also purchase partly developed claims.

Felix Frankfurter said in an interview published Dec. 15 in the New York *Times*, while discussing the labor problem, "It was no field for outside, dilettante interest." This led *Industry* shrewdly to wonder if that does not explain the failure of Mr. Frankfurter's War Labor Policies Board.

Promontory was a new place, where they had no "Hotel and Restaurant Keepers' Mutual Protective Association," wrote Dan De Quille in the "Great Bonanza." A Comstocker went out to Promontory to prospect; and when dinner was ready the landlord took a double-barreled shot gun from behind the bar, and stepping out in front of his house, fired off one of the barrels.

The Comstocker, who had followed him to the door to see what was up, said to him: "What did you do that for?"

"To call my boarders to dinner," said the landlord.

"I see," said the Comstocker, "But why don't you fire off both barrels?"

"Well," said the landlord, "you see, I have to keep the other to collect with."

J. Rambosson, of the French Academy of Sciences, in 1870 published a work entitled "Les Pierres Precieuses et les Principaux Ornements" ("Precious Stones and the Principal Ornaments"). He first describes the more important precious and semi-precious stones; then ivory; next the metals are taken up—first gold, then silver, then platinum; and lastly, to one's surprise in these days of its great commercial application, aluminum. In fact, to it Rambosson gives five times as many pages as to platinum. He states that because of the lightness of aluminum, one kilogram, valued at $60 (equivalent to about $27 per lb.), may replace four kilograms of silver, worth from $160 to $180, that is, aluminum was then from 33 to 50% more expensive than silver. Rambasson is of the firm opinion that because of the metal's beauty it will have a wide use in jewelry and the arts. The world moves, and in 1914 about 68,000 tons of aluminum was produced, and a kilogram was then worth about 40 cents.

There is nothing vague or incomprehensible about Bolshevism as it is explained in *The New Europe* by M. Rostovtzev, who says a group of agitators, almost microscopically small in the beginning, as compared with the whole population of that great country, raised themselves to power by the promulgation of a watchword of wonderful simplicity. It was as brief as simple—"Steal what has been stolen"—and to be perfect for its purposes it needed only the addition that was promptly made—"Kill those who resist." The result in Russia, as M. Rostovtzev says, has been what might be expected. "Civil liberty," he writes, "has been trampled on; there is no trace of personal freedom; unrestrained tyranny and bureaucracy reign supreme. Russia produces nothing and lives with difficulty on what was accumulated formerly, on the remains of its material and spiritual capital. The result is famine, cold, and cruel death, hovering over every man and waiting him at every crossroad."

"McDermott, recently appointed manager of the Ivanhoe, is one of a small group of Maorilanders, including J. A. Agnew and W. A. Macleod, who have made good in Westralian mining," says a writer in the Sydney *Bulletin*. "Formerly underground boss of the show he is now running, McDermott went to the Sons of Gwalia, mainly on the advice of Govett, Ivanhoe's chairman of directors, when that property was in a state of disintegration owing to bad handling. He put the show on its feet again, and a grateful company sent his salary up to £2000 a year. On the demise of Bob Nicolson, Ivanhoe's manager last year, Govett, remembering McDermott's work at the Gwalia, selected him to the gilded billet, worth £3500 a year, from hundreds of applicants all over the world. The Gwalia has made other reputations. Here W. J. Loring, a 'newchum' from the United States, got the chance of his life. Agnew was another helped on the upward path by the Gwalia, and so was H. C. Hoover, now U. S. Food Controller and mentioned freely as a future president of the Republic—a pallid, slimly built individual who eyed you furtively and didn't say much. He established the system of allocating costs of mining, treatment, and development to the separate departments, instead of the old-time generalization of expenditure, which made it difficult to discover waste and incompetency and sent good mines on the rocks. Macleod did not owe anything to the Gwalia, but came west from Charters Towers to take full charge for Bewick, Moreing & Co. on the recommendation of Dr. McLaren, the geologist (another Maorilander), and has since drifted to London in a superior capacity for the firm."

"So many o' these 'ere h'accidents can be prevented, m'son, if a man 'as proper 'h'understandin' o' things," said Cap'n Dick. "So h'often man says one thing w'en, dam-me, 'e means t'other, an so ut's naw wonner as 'ow there's confusion an h'accidents. Naow, 'ere's story 'baout 'Arry Pollard so thee'll naw w'ot I'm drivin' to. 'Arry, as thee may 'ave 'erd, wuz 'andy at fitin', but 'ol bloody trouble wuz 'e wuz h'over-confident. 'Ere 'e wuz braggin' 'baout w'ot a fiter 'e wuz, till, dam-me, one day long comes young feller 'oo said e'd 'ave a go with un. So ussen h'arranged one o' these 'ere bouts. 'Arry, 'e 'ad to 'ave a second, so Jan Kevern said 'e'd bear un h'out, an' so they started. Firs' raound this 'ere young chap, h'Irish 'e were, 'e druv 'Arry to one corner, poundin' 'im 'baout tha 'ead an h'eyes sumpin' h'awful. But 'Arry, 'e wuz smilin' as 'e went to corner, an' sez 'e to Jan, ''Ow ar't gawin' naow, Jan?' ''Andsome, 'Arry, 'andsome. Thee's lookin' like a bloody lion,' sez Jan. 'Gos h'up, naow, an scat to un next raound, 'Arry.' So 'Arry, 'e h'up an pasted, an, dam-me, did'nt seem to 'it nawthin' but h'air. W'en time wuz called for second raound, 'Arry, 'e sez, 'Jan, 'ow's makin' it naow? Better this time, was'nt un?' 'Oh, dam-me, m'son,' sez Jan, 'Th'art lookin' like a bloody lion. Gos on, naow, do; thee surely can clean un this raound.' So 'Arry 'e starts third time. Afore long 'e wuz wobblin' from side to side, an' this 'ere h'Irish chap wuz rainin' blaws somethin' h'awful. Short while, an' dam-me, 'ere wuz 'Arry flat on 'is back. So we 'ad to carry un h'out an give un h'air. W'en 'e come to, firs' bloody thing 'e said wuz, 'Well, Jan, 'ow's lookin' naow?' 'Like a bloody lion you,' sez Jan. ''Ere naow, Jan, don't believe th'art ever seen one o' these 'ere lions,' sez 'Arry. 'Coorse I 'ave,' sez Jan. 'Doan thee remember tha one ol' Mother 'Oney used to 'ave in 'er bairn, in ol' country, with gert flat h'ears?' 'Gos along, do, Jan; tha wer'nt no bloody lion; t'were a jackass." 'Well, 'Arry,' sez Jan, ''im were w'ot I meant.'"

Personal

Have You Contributed to the Association of the 27th Engineers?

Martin Schwerin is now in Cave in Rock, Hardin County, Ill., where he will remain for some time.

Herbert C. Hoover has been promoted to the grade of Commander in the Order of the Legion of Honor.

A. D. Nicholas has been appointed controller for the Calumet & Hecla Mining Co. and all subsidiary companies.

A. J. Edwards, of Batesville, Ark., has been made director of the newly created war-minerals section of the American Mining Congress.

Major John C. Greenway will soon return to Bisbee, Ariz., to resume his duties as general manager of the Calumet & Arizona Mining Company.

E. R. Watson has been elected president of the Balbach Smelting and Refining Co. He is a member of the law firm of Barber, Watson & Gibboney.

R. R. Seeber, mining engineer, formerly manager of the Winona Copper Co., Winona, Mich., is now in the lumber business at Dalhousie, New Brunswick.

Capt. Percy E. Barbour has been transferred from the 150th Engineers, Camp Shelby, Miss., to the 212th Engineers, at Camp Devens, Massachusetts.

Algernon Del Mar has left Superior, Ariz., and is erecting a concentrator for the Montezuma Mining and Reduction Co., near Big Pine, Inyo County, California.

C. E. Addams, formerly general manager of the Ray Hercules Copper Co., Ray, Ariz., has resigned as vice-chairman of the Arizona Council of Defense.

Harry Reeder, formerly engineer for the Isle Royale Copper Co., Houghton, Mich., has been appointed superintendent of the Naumkeag Copper Co., to succeed **Sidney S. Lang.**

E. M. Hamilton, metallurgical engineer, of the firm of Hamilton, Beauchamp, Woodworth, Inc., San Francisco, Calif., has gone to Parral, Mexico, where he will remain for about two months.

D. Sloane, manager of the Davidson Gold Mines, Ltd., of Porcupine, Ont., has resigned to accept a position with the Hollinger Consolidated Gold Mines, Ltd. **N. J. Evered** is his successor.

James Colquhoun, formerly president of the Arizona Copper Co., and now a resident of Tunbridge Wells, England, lately returned from Russia, having gone through all of the revolution there.

Holman I. Pearl, mining engineer, of Crosby, Minn., is spending the month of January in oil-examination and geological work in the Gulf Coast area and in southern Alabama and Mississippi.

F. E. Bourget has resigned from the U. S. Fuel Administration, Washington, D. C., and has been appointed special sales agent for the Interstate Coal and Dock Co., with headquarters at Cincinnati, Ohio.

R. L. Lee has been relieved from his duties in the metallurgical section of the U. S. Ordnance Department, and is now superintendent of the Arizona Smelting and Power Co., at Benson, Arizona.

William A. Burr, mining engineer, is recovering from injuries received in an accident last June, while on his way to Mexico. He is now visiting Arizona plants, but intends resuming his trip to Mexico soon.

Arthur L. Sweetser, mining engineer and chemist, has withdrawn from the editorial staff of the *Engineering and Mining Journal* and has sailed for Antofagasta, Chile, as metallurgical chemist for the Penyon Syndicate.

James M. Platt, assistant manager of the Sociedad Explotadora de Caylloma, Cons., operating mines at Caylloma, in southern Peru, has resigned to become mine superintendent of the La Blanca properties at Pachuca, Mexico.

Norman L. Bowen, for some time with the U. S. Geological Survey, has been appointed professor of mineralogy at Queen's University, Kingston, Ontario. During the war he successfully experimented in making optical glass.

William H. Hampton, metallurgical engineer, who was in charge of the miscellaneous gas defense apparatus department, General Defense Division, Chemical Warfare Service, U. S. A., has resumed his engineering practice.

K. B. Thomas has resigned as superintendent of the sulphuric-acid department of the Calumet & Arizona Mining Co., Douglas, Ariz., to become general superintendent of the Standard Chemical and Oil Co., of Troy, Alabama.

Robert W. Hunt was given a dinner in Chicago, on Dec. 9, on the occasion of his 80th birthday. A resolution extending greetings and congratulations, passed by the directors of the American Institute of Mining Engineers, was presented to him.

Prof. C. K. Leith recently sailed for France to act as mineral adviser for the U. S. Peace Commission. With him were **B. M. Baruch**, chairman of the War Industries Board, **Vance McCormick**, chairman of the War Trade Board, and **Walter Tower**, of the Shipping Board.

H. DeWitt Smith, superintendent of the United Verde Copper Co., Jerome, Ariz., who was called into the aviation service during the war, is among those returning to the company; likewise **Clarence V. Hopkins**, chief engineer of the company, who has been discharged from the service.

C. R. Seabrook, formerly structural engineer of the Chile Exploration Co., at Chuquicamata, Chile, and recently engaged in the Air Nitrates Division of the Ordnance Department, U. S. A., has accepted the position of structural engineer with the H. M. Lane Co., of Detroit, Michigan.

G. T. Hansen, manager of the Allis-Chalmers Manufacturing Co., Salt Lake City, and **F. B. Weeks**, engineer of the United States Refining, Mining and Exploration Co., Salt Lake City, recently made a final examination of the Lucky Deposit copper mine, situated at Aurum, White Pine County, Nevada.

R. H. Stewart, mining engineer, of Vancouver, B. C., has been appointed by the provincial government to direct the adjusting of the income tax to which the mining companies operating in British Columbia are subjected. He will review the companies' balance sheets from a technical point of view.

Henry Bruere has resigned as Federal director of the U. S. Employment Service for the State of New York. He will remain with the service as chairman. His successor as executive head of the service is **Dr. George W. Kirchwey**, who was assistant Federal director for New York State and at one time dean of Columbia University.

F. D. Baker, mechanical engineer, formerly engaged in mechanical and mill-design work in Colorado, and chief engineer of construction work for the Colorado department of the American Smelting and Refining Co. since its organization, in 1899, retired from the latter position on Jan. 1. He will be associated with his sons in consulting work in mine, mill, and mechanical practice in Denver, Colorado.

W. B. McKinlay has returned from Cuba and is now in New York. Others who have been in the city during the last week and who registered at the office of the American Institute of Mining Engineers were T. C. Roberts, Perth Amboy, N. J.; William T. Bates, Mascot, Tenn.; Capt. E. H. Clausen, Washington, D. C.; W. F. Ferrier, Ottawa, Canada; L. E. Booth, Anaconda, Mont.; Lieut. M. S. Mazansy, Camp Custer, Mich.; and C. W. Cromwell, Warren, Arizona.

J. R. Finlay is spending the winter at Tucson, Ariz. He is devoting a good deal of time to the revision of his book on the cost of mining, which will make it practically a new treatise, and is planning to introduce about 15 entirely new chapters, to condense and alter the old ones and to bring the statistics up to date. He also purposes discussing, with reference to coal and iron, the industrial clearing houses, the nature and use of capital, the international importance of mineral industries and resources, the community and national level of efficiency, broad geological facts, and other important related subjects.

Obituary

Martin Pattison, president of the Denn-Arizona Copper Co., died at his home in Superior, Wis., on Dec. 20, aged 78 years.

Manville Hendricksen, mining engineer, died on Dec. 19, aged 26 years. He was born in Grafton, N. D., and was a graduate of the University of Wisconsin.

Dr. L. P. Morgan died recently in San Diego, Calif., of pneumonia. He was interested in the International Syndicate of Mines and Smelters, and had important interests in Copper Basin, near Prescott, Arizona.

L. S. Woodbury, founder and president of the Great Falls Iron Works, Great Falls, Mont., died on Nov. 22 at the Hudson Sanitarium, Hudson, Wis., following a stroke of paralysis. He was born in 1838, in Nashua, Hillsboro County, N. H., where he received his education. When he resigned as general manager of the Canadian Copper Co.'s mines in Sudbury, Ontario, in 1890, he went to Great Falls, Mich., where he organized a company of his own, the Great Falls Iron Works. He was a member of the American Institute of Mining Engineers and the American Society of Mechanical Engineers.

Societies

Canadian Mining Institute will hold its twenty-first annual meeting on Mar. 5-7, 1919. An effort will be made to celebrate fittingly the conclusion of the war. Members have been advised that interesting papers are desired, especially those of a practical nature relating either to mining or metallurgy.

American Institute of Mining Engineers, Columbia section, elected J. C. Haas chairman at the annual session recently held in Spokane. William J. Hall, of the Federal Mining and Smelting Co., Wallace, Idaho, was elected vice-chairman, and L. K. Armstrong was reëlected secretary-treasurer. The section has 196 members, of whom 20 are in the Army.

Institute of Chemistry (British) held a meeting of its council on Nov. 29, at which the formation of local sections at Birmingham, Swansea, and Dublin, was duly confirmed. The finance committee submitted a further report on the subject of raising the annual subscriptions of members and students to whose interests the additional income will be devoted, in every possible way.

American Society of Mechanical Engineers announces that hereafter it will compile and publish the "Engineering Index," which has been published for 25 years in the *Engineering Magazine* and its successor, *Industrial Management*, and universally regarded as a standard index to engineering periodical literature. The first issue of the "Index" under its new management will appear in the January number of the "Journal" of the Society.

Industrial News

Union Carbide Sales Co. announces that, as the war is over, no difficulty will be experienced in obtaining prompt shipments of Union carbide.

Syracuse Smelting Works, of Brooklyn, Chicago, and Philadelphia, will hereafter conduct the sale of its products under the name of the parent company, "United American Metals Corporation."

Consolidated Steel Corporation announces that it is now prepared to receive and give prompt attention to all export inquiries for steel products. Its new offices are at 165 Broadway, New York. In addition to E. A. S. Clarke, who was chosen president of the company, the following have been elected: Vice-president, H. H. Barbour; secretary and controller, L. W. Hesselman; treasurer, A. Van Winkle; and traffic manager, William Hayman.

New Patents

United States patent specifications may be obtained from *The Engineering and Mining Journal* at 25c. each. British patents are supplied at 40c. each.

Acid-Concentrating Apparatus. John Patten, Baltimore, Md. (U. S. No. 1,286,188; Nov. 26, 1918.)

Acid-Concentration, Apparatus for. John Patten, Baltimore, Md. (U. S. No. 1,286,080; Nov. 26, 1918.)

Amalgamator, Centrifugal. Albert J. Anderson, South Pasadena, Calif. (U. S. No. 1,284,963; Nov. 19, 1918.)

Copper, Lead and Phosphorus, Composition of. George P. Kline, Moline, Ill. (U. S. No. 1,285,231; Nov. 19, 1918.)

Flotation Apparatus. Arthur C. Daman, Denver, Colo. (U. S. No. 1,285,061; Nov. 19, 1918.)

Flotation—Apparatus for Separation of Minerals. Frederick D. S. Robertson, Toronto, Ontario, Canada. (U. S. No. 1,286,111; Nov. 26, 1918.)

Furnace Construction. William S. Robinson, Benton Harbor, Mich. (U. S. No. 1,286,114; Nov. 26, 1918.)

Editorial Correspondence

SAN FRANCISCO—Jan. 11

The Gold Mines in Amador County of California are again full handed and are turning applicants away. This is because of the stoppage of the Liberty shipyard building on San Francisco bay; and it is expected that the copper curtailment about to take place will give the other gold mines practically all the miners they can use.

A California Chapter of the American Mining Congress is in process of being organized. The organization meeting, having been postponed on account of influenza in October, will be held at the Palace Hotel, San Francisco, on Jan. 15 and 16. It was called by a committee formed at the time of the visit of James F. Calibreath, secretary of the parent body. This committee is composed of Albert Burch, L. D. Gordon, Capt. John Barneson, Fletcher Hamilton, of San Francisco, and Philip Wiseman, of Los Angeles. It is hoped to interest representatives of all branches of metal mining and the petroleum industry. These interests are in need of the legislative assistance that the Mining Congress has been striving to obtain for its chapters in other parts of the West.

DENVER—Jan. 10

Committee on Mines and Mining of the Colorado State Senate is composed of the following: John H. Slattery, chairman; Walter F. O'Brien, Siewers Fincher, Henry O. Andrew, John J. Tobin, W. W. King, L. A. Puffer, and John B. Stephen.

"Blue Sky" Laws were the subject of considerable discussion at the recent meeting of the Colorado Metal Mining Association, and bid fair to receive much attention in the new Legislature now in session. After correspondence with 29 states which have "blue sky" laws, Dudley B. Humphrey has prepared the draft of a bill which has caused lively interchange of opinion and discussion among mining men. Among miners of the state there is a feeling against the establishment of a commission to control stock operations, and against the growth of commissions generally. The average citizen appears to resent being told by any commission how he shall invest his money, or in what stocks he may gamble. However, no one seems to disagree with the proposal that there must be new legislation designed to curb the irresponsible promoter and punish those who deliberately misrepresent the possibilities of mining securities.

SALT LAKE CITY—Jan. 10

Mining in Utah is facing the problem of adjustment to post-war conditions. The question is complicated by the more or less artificial conditions prevailing during the latter period of the war, price fixing and other emergency regulations, and the war demand for minerals. Copper and lead producers are feeling the fall in prices most heavily, but the steady price of silver is helping the situation in the state, especially as to lead ores in which silver is also present. The problem in the matter of labor supply has been reversed, and mining companies are facing the question as to what proportion of their men not needed in production can be turned to development work and how large a proportion will have to be discharged. Labor is still high, and the excessive cost of materials precludes the undertaking of too much dead work, especially that requiring the use of timber and other materials. The Utah Copper Co. is cutting down both its output and its working forces. Smaller companies are doing the same. In general, the industry may be said to be in a waiting position pending the stabilization of prices and the more regular operation of the law of supply and demand.

Production of Potash From Leucite rocks of Wyoming has attracted Utah capital. Articles of incorporation of the Liberty Potash Co. were recently ready for recording with the Secretary of State. The capitalization stated is $11,000,000, of which $1,000,000 is preferred. The company has holdings of 2030 acres containing leucite lava flows, 50 to 75 ft. in thickness, at Superior, near Green River, Wyo. A spur has been extended from the Union Pacific R. R., and a plant is being built about a mile from Green River. About 120 men are employed. The process will consist of roasting the finely crushed rock with salt and limestone to obtain potash in the form of chloride. Work will be done on a large scale. Cheap fuel will be obtained from the Wyoming coal fields. There is no question regarding tonnage of leucite rock available, which carries 10% and upward in potash, if the process works out commercially on a large scale as indicated by the experimental plant. Those interested are T. W. Boyer, president; Guy Sterling, J. B. Scholefield, Moylan C. Fox, and E. M. Allison, Jr., of Salt Lake City; A. Kendall, Rock Springs, Wyo., and P. J. Quealy, Kemmerer, Wyoming.

PHOENIX, ARIZ.—Jan. 10

Curtailment in Arizona Copper Activities has begun in the larger properties. For some time there has been a tendency in this direction on the part of smaller operators. As indicated several weeks ago, the Shannon has ceased mining operations at Metcalf and has announced that smelting will stop at its Clifton plant as soon as ore supplies are exhausted. Old Dominion, at Globe, has shut down, though this was caused by sabotage within its works. Whatever the cause of the outrage, it has served to throw out of work about 1500 employees of a company noted for its liberality and consideration for its men. Local labor representatives claim that 500 men are unemployed at Clifton, 1600 at Bisbee and Douglas, and about an equal number at Ray and Hayden, though these statements may not have an accurate basis. They claim, also, that many miners are arriving in Arizona camps from Butte and other northern points. It would appear that Arizona, for the first time in years, is beginning to have a condition of unemployment. Already there is agitation in favor of starting large road works. The Bisbee mines, particularly, have announced that they are about to start upon an extensive development campaign, for their reserves, particularly of the higher grades of ore, have been seriously depleted by war demands. This policy is expected to provide work for possibly a third of the men who have been on the payroll of some of the larger copper producers. Possibly seizing upon the necessary curtailment of employment as an excuse, many I. W. W. are reported to be flocking into Arizona and to have started their work of trouble breeding.

JOPLIN—Jan. 11

The Premier Mine, at Picher, Okla., has paid $80,000 in dividends and has $30,000 in the treasury after paying off $40,000 of debts. Operations were started at the Premier in February, 1918, and it has been a large producer of lead as well as of zinc blende. A. M. Gaines, of Joplin, is manager.

Proving of a New Sheet Ground Field south of the old camp of Granby is continuing. During the last week in December, Heaton & Hodges put down an eight-inch hole through 205 ft. of lime and 30 ft. of overburden into sheet-ground formation similar to that reported in previous strikes in the section. The hole was drilled so that a Pomona pump may be installed immediately for shaft sinking. Two other shafts are being sunk near the first strike on the land, about a quarter of a mile distant, but progress has been slow.

The Tri-State Mine Safety and Sanitation Association is in good financial condition. This is the principal mine operators' organization in the field at present. The semi-annual report of A. E. Bendelari, treasurer, made at the last meeting, showed that, though expenditures during the last six months were $3646, there was a balance in the treasury of $1107.65 on Jan. 1. Most of the expenditures in the last half year were made in an effort to better the zinc-ore market. A number of committees have been sent to Washington, and some good has been accomplished.

Hope in the American Zinc Institute has revived, in the Joplin district, as a result of the announced early departure of George C. Stone, of the New Jersey Zinc Co., to investigate conditions in Europe, looking toward a possible market abroad for American zinc ore or spelter. It is understood that, though Mr. Stone's appointment was made by Pope Yeatman, the whole move was really inspired by the Zinc Institute; and that though C. E. Siebenthal was the original choice of C. T. Orr, of Webb City, Mo., president of the institute, Mr. Stone is entirely satisfactory both to him and to other members of the institute from the district.

The Webber and Pelican Mines of the Commerce Mining and Royalty Co. are making a recovery that is exceptional even for the rich mines of the Oklahoma-Kansas section of the zinc and lead field. The Webber is situated in Kansas, across the state line north of Picher, and has been in operation since last June. On account of a poor ore market, production has not been pushed and the mill has never put on more than one shift. The mine, nevertheless, has been a large producer and much ground has been cut out. Last week, the mill recovered from the ore as taken from the ground 17% of its weight as blende and lead (locally termed 17% recovery). The Pelican is a new mine, recently opened, situated southwest of the Webber and across the state line in Oklahoma. Its mill recovery last week was 16% blende and lead (in the language of the district). Though recoveries higher than these have been reported from time to time, they are exceptional, and rarely does a mine that has been operated for eight months show a recovery above 10% from the run of mine material.

HOUGHTON, MICH.—Jan. 7

The Seneca Shaft cut the Kearsarge lode on Dec. 28 at 1625 ft. depth and has penetrated it for some distance. Thus has been proved the correctness of diamond-drill interpretation and of the showing made in the Mohawk and Ahmeek properties adjoining. The lode material appears to meet requirements and carries little mass copper, in which the new opening is in line with the general characteristics of the formation. The copper content is estimated at about 30 lb. per ton at the point cut. Shaft sinking will continue through the lode and beyond for at least 700 ft. more.

BOSTON—Jan. 2

Actions To Recover Taxes Illegally Assessed from 1913 to 1915 were recently filed in the U. S. Court in Boston by 15 copper companies. Total involved is $384,000. Papers were served upon the Collector of Internal Revenue. Actions were based upon interpretation of terms "capital" and "income" as applied to copper companies. Calumet & Hecla filed an action for $125,000. Other plaintiffs are the Champion Copper Co., Allouez Mining Co., St. Mary's Mineral Land Co., Copper Range Co., Assignee Baltic Mining Co., Ahmeek Mining Co., Trimountain Mining Co. and Osceola Consolidated.

VICTORIA, B. C.—Jan. 10

An International Mining Convention will be held in Vancouver, B. C., some time during March, 1919. It had been proposed that this gathering should be called for January, but a postponement to the latter date has been agreed upon by the members of the Vancouver Chamber of Mines. The convention has the endorsement of William Sloan, Minister of Mines, and the resident mining engineers of the various mining districts of the province are expected to take an active part. The proceedings are likely to be of special importance because of the problems bearing on the mining industry and the reconstruction period that will come up for consideration.

TORONTO—Jan. 11

Cobalt Mines are hampered from power shortage due to a breakdown of part of the equipment at the Matabitchewan power plant. One of the large castings set in concrete that led from the penstock to the turbines has cracked badly, and necessitated a shut-down of the unit. The accident occurred a couple of months ago, and much dissatisfaction has been expressed at the length of time it is taking to make repairs. Some of the mines have had to start up compressor plants which have not been in use for years, and there is talk of a couple of the deeper mines having to shut down altogether.

The Mining News

ALASKA

KENNECOTT (Kennecott) — December production of copper was 14,114,000 lb., including the output of Braden Copper Company.

ALASKA GOLD (Juneau)—In December milled 117,310 tons of ore, averaging $0.983 per ton. Extraction was 80.57%; tailings loss 19.1c. per ton.

ARIZONA

Cochise County

COPPER QUEEN (Bisbee)—Has paid bonus to 1400 employees of mines and smeltery of $96,040, based on second year's service. Same system effective in Calumet & Arizona mines and works. Bonuses to be paid monthly, on expiration of employees' year or two-year periods of service.

PHELPS DODGE (Bisbee)—December production of copper was 12,563,000 lb. for all properties.

SHATTUCK ARIZONA (Bisbee)—December output was: Copper, 506,332 lb.; lead, 401,593 lb.; silver, 21,506 oz.; and gold 85.98 oz. Output for 12 months was: Copper, 9,081,959 lb.; lead, 2,420,690 lb.; silver, 161,230 oz.; and gold 1220.12 ounces.

CALUMET & ARIZONA (Warren)—December production of copper was 3,094,000 pounds.

Gila County

LONDON-ARIZONA (Chilito)—Internal affairs adjusted and plans made to resume operations. Several profitable leases expired with end of year. Company plans to ship to Hayden, and to Lavelle company plant as soon as latter is completed.

OLD DOMINION (Globe)—This and Arizona Copper Co.'s mines forced to close down on Jan. 8 when electrical equipment of Old Dominion flotation mill was put out of operation by bolt thrown into motor, destroying windings; 1500 men idle in consequence. Sabotage held responsible. December copper output of Old Dominion was 2,686,000 pounds.

INSPIRATION (Miami)—December production of copper was 7,350,000 pounds.

MIAMI (Miami)—December production of copper was 4,989,435 pounds.

Greenlee County

SHANNON COPPER (Clifton)—December output was 688,000 lb. of copper.

ASH PEAK (Duncan)—Goldfields Consolidated sunk main shaft to 800 ft. under lease and option. Charles Starr, manager.

ASH PEAK EXTENSION (Duncan)—Working small force. J. Horgan, superintendent.

Maricopa County

ABE LINCOLN (Wickenburg)—Shipping high-grade chalcopyrite ore from tunnel, which is being driven to cut new 700-ft. shaft about 280 ft. from surface. C. E. Nathorst is manager.

Pima County

NEW CORNELIA (Ajo)—December production of copper was 4,248,000 pounds.

Pinal County

MAGMA CHIEF stockholders have ratified purchase of Sombrero Butte property in Copper Creek district. Exchange of stock will be at par.

GOLDEN BELL (Kelvin)—Station cut at 200 level and drifting in progress on two feet of copper ore.

TROY ARIZONA (Kelvin)—Retimbering of Alice tunnel completed, and tunnel equipped with new rails. No. 5 Buffalo blower, driven by gasoline engine, installed to afford ventilation at face. Development now in progress on low-grade ores opened up when tunnel was originally driven.

RAY CONSOLIDATED (Ray)—December production of copper was 5,800,000 pounds.

QUEEN CREEK (Superior)—Shipments of copper ore begun. Sinking continued with good results.

SILVER KING (Superior)—Operating 30-ton Marcy mill, with flotation equipment. Second mill ordered. Five tons of concentrates shipped to El Paso sampled $1500 a ton, mainly in silver. Main shaft retimbered to 400 ft. Management claims development of 10,000 tons of ore sampling above $20.

Yavapai County

COPPER KING (Hillside) — Shipping 45% zinc ore by motor truck to railroad from property near Bagdad in Eureka district. Operated by Hillside Development Co. E. D. Gluwas in charge.

JEROME-PORTLAND (Jerome)—Reorganized as Jerome-Bisbee, with stock exchange at par. Receiver R. B. Westerveldt, of Prescott, discharged. President is George Brookshire, former owner of ground; L. H. Beyerle, of Prescott, secretary. Exclusion made of 11,000 shares issued by former manager, A. B. Frame. Property has 500-ft. shaft and 2800 ft. of development work.

PITTSBURG-JEROME (Jerome) — To resume operations under C. C. Arata, to follow streak of glance ore found on 500 level.

VERDE COMBINATION (Jerome)—Shaft down 1200 ft. in blue schist and quartz.

ZONIA (Kirkland)—Has changed hands. New owners developing copper orebody and building offices and roads.

SIMMS GROUP (Mayer)—Sold to Halling P. Overton, who will develop property.

MARK TWAIN (Prescott)—Option taken by R. E. Moore, J. F. Healey, and O. F. Smith from Cleveland owners. Mine is old silver producer, with production record of $250,000; opened by three tunnels, tapping 16-ft. ledge.

CALIFORNIA

Amador County

ARGONAUT (Jackson)—Trouble with highgraders reported, involving several arrests. New ore disclosed in lower levels. Increased production contemplated. Labor supply better.

PLYMOUTH CONSOLIDATED (Plymouth)—Operating with full crew. Development, retarded by war conditions, now resumed. Mill ran steadily during 1918.

Butte County

WESTERN ORE (Oroville)—Will resume chrome mining, despite market conditions. Contracts with chemical companies said to make resumption possible.

Calaveras County

EASZY BIRD (Mokelumne Hill)—New shaft down 80 ft. Will go to 150 ft. before crosscutting.

Contra Costa County

BUTTERS ELECTROLYTIC ZINC (Martinez)—New machinery installed. Operating on ore from which good results are reported. Thirty men employed. Charles Butters manager.

Humboldt County

CHROME INDUSTRY at standstill. Representatives who were to take up the matter of prices and marketing of chrome and manganese ores and concentrates with American Mining Congress have made no report.

Nevada County

IN GRASS VALLEY DISTRICT, six large mines and several small ones operating full time and employing in all 1200 men. Crews increased at Empire, North Star, Union Hill, Golden Center, Sultana and Allison Ranch. Le Duc and other small mines preparing for increased production.

SAILOR FLAT gravel mines making ready for new development on large scale. Field formerly supported several large operations. Present undertaking by H. L. Engelbright, Dan McFall and other Nevada City mining men.

Placer County

LIBERTY HILL (Dutch Flat)—Dam on Bear River approved by California Debris Commission. Bypass closed and hydraulicking to begin as soon as reservoir is full.

Nevada County

QUAKER HILL (Nevada City)—Machinery installed and ready for resumption of hydraulic mining. Water supplied by 21-mile flume. Operation by New York men. H. L. Engelbright, manager.

San Benito County

NEW IDRIA (Idria)—Old furnace No. 1, in use for 20 years, being torn down. Bricks and stone will be run through new furnace to recover quicksilver. Product hauled by motor trucks to Tres Pinos, 65 miles distant, and shipped by Southern Pacific. H. W. Gould, of San Francisco, manager; 700 men employed at three camps.

Shasta County

MAMMOTH (Kennett)—December output of smeltery was 1,660,000 lb. of copper.

PIT RIVER POWER (Redding)—Contract for deed stipulating price of $194,093 filed with county recorder.

COLORADO

Clear Creek County

WESTERN TUNNEL (Idaho Springs)—Control secured of Vindicator property on Chicago Creek. Systematic development will begin in next 30 days. New compressor ordered. Egan mill to be remodeled and new equipment installed, including flotation unit. Mill operated by water power. Cleveland capital back of enterprise. J. H. Marshall manager.

San Juan County

SILVERTON SHIPMENTS during December were as follows: Iowa-Tiger, 11 cars; Mayflower Leasing, 7; S. D. & G. Lease, 3; Mativi Bros., 2; Dives Leasing, Caledonian Mining and Milling, and Henrietta, one car each; miscellaneous small lots, 23 cars; total, 49 cars.

GOLD KING EXTENSION (Gladstone)—During last few months much underground development and repair work done on Gold King properties, which company is operating. Mill remodeled and new equipment installed. W. Z. Kinney is manager.

San Miguel County

TELLURIDE SHIPMENTS during December were as follows: Tomboy, 35 cars; Smuggler-Union and Black Bear, 90 cars; total, 125 cars.

Teller County

KOMAT LEASING (Cripple Creek)—Company operating Victor mine will drive laterals from 1000 level to prospect ground of Anona Gold Mining Co. Latter's property, including Little Ella, Minnie, Lee, Cactus and Clionian mines, or about 26 acres, has been secured under five-year lease by Komat. Math Korff is general manager.

BLUE FLAG (Victor)—Operations resumed under superintendence of F. J. Yates. Shaft to be deepened from 1227 ft. to 1400 level, where crosscut will be driven to prospect property. Will then raise from 1100 level. Reported ample finances are available to carry out development scheme proposed.

MICHIGAN

Copper Country

ALLOUEZ (Allouez)—Shipped 36,000 tons of rock in December, and 500,000 during 1918.

CALUMET & HECLA (Calumet)—Company and subsidiaries using 42 storage batteries for tram haulage, 12 at Isle Royale, 12 at Ahmeek, 5 at North Kearsarge, and 13 at Calumet & Hecla. Five more ordered for last named. Working satisfactorily. Allouez using all trolley locomotives.

CENTENNIAL (Calumet)—Rock output in 1918 over 170,000 tons, against 148,332 in 1917 and 138,136 in 1914.

LA SALLE (Calumet)—Produced 160,000 tons of rock in 1918.

SUPERIOR (Calumet)—Rock shipments in 1918 approximated 104,000 tons, production for last five years declining steadily.

FRANKLIN (Demmon)—Produced 18,000 tons of rock in December.

HANCOCK (Hancock)—December rock output, 16,000 tons, making 190,000 tons for year.

MASS (Mass)—Rock output for December was 20,000 tons.

OSCEOLA (Osceola)—Rock output for December 94,000 tons, making year's total 1,230,000.

MINNESOTA

Mesabi Range

SHIRAS MINE (Buhl)—Failure of miners to notify officials of Oliver Iron Mining Co., operators of property, of a blast in one of the stopes, resulted in injury to three of the men who were making an inspection of the property and entered the room just as the explosion occurred. They were struck by flying pieces of rock.

MISSOURI

Joplin District

C. C. & B. (Joplin)—Making two cars of calamine weekly from output of new mine south of old McGee silicate mine at Duenweg. Mill running only one shift. Ore level at 120 feet.

MONTANA

Jefferson County

LEGAL TENDER (Clancey) — Ore shipped from 200 level.

MONEY (Clancey)—Drifting on 140 level and preparing to ship ore mined from shaft.

ANGELICA (Wickes)—Sixty tons crude ore per day shipped to smeltery from Mt. Washington mine.

Lewis and Clark County

BELL BOY (Marysville)—Crosscut encountered gold-bearing ore.

VALLEY FORGE (Rimini)—Stoping and shipping lead-silver ore from above 600 level.

Powell County

MONARCH (Elliston)—Large tonnage of low-grade lead-silver ore exposed in workings. Property taken over by New York-Montana Testing and Engineering Co., Helena. Mill to be built in spring.

Silver Bow County

ANACONDA (Butte)—Announced on Jan. 2 that directors have authorized issue of $50,000,000 ten-year secured gold bonds, one-half of which, known as Series A, to be issued immediately as of Jan. 2. Proceeds to be used for equipping properties of Andes Copper Mining Co. and Santiago Mining Co. and to replace in current account part of company's invested earnings. Andes company has completed wharfs and warehouses at Barquito; has built 58 miles of main line railroad; is building 5½-mile section from mill site to mine, also office buildings and houses for employees. Temporary power plant transmission from coast to mine, water supply line, and other necessary features of plant operation are also under construction, and definite plans for permanent plant are being prepared. South American mines not fully explored. At Butte, the Original and Leonard mines closed Jan. 2 for repairs requiring several months; Pennsylvania shut down Jan. 10; Anaconda and Neversweat shut down in December on account of Parrot fire, and are still down indefinitely. December copper production was 21,900,000 lb. Company's smelteries have reduced working forces over 50 per cent.

BUTTE & SUPERIOR (Butte)—December production was 10,600,000 lb. of zinc in concentrates and 220,000 oz. of silver. Petition of Minerals Separation company for order restraining the mining company from dissipating its assets was denied by U. S. Supreme Court on Jan. 7. Court set Mar. 3 for argument.

EAST BUTTE (Butte)—December production of copper smeltery was 1,929,720 lb. of copper.

NEVADA

Esmeralda County

GOLDFIELD CONSOLIDATED (Goldfield)—Mill-treating about 6000 tons monthly from Mohawk, Clermont, and Grizzly Bear workings, one-half by cyanidation and half by flotation. Development at Combination mine opening milling-grade ore. Treatment of mill tailings discontinued for winter.

GRANDMA (Goldfield)—Lateral development to open up contact zone now under way. Shaft 830 ft. deep. Further development at 250 level planned.

Humboldt County

ROCHESTER (Rochester)—Winze from 1100 level has proved oreshoot to 1200 level. Blocking out ore between tenth and eighth levels. Daily tonnage milled during first half December averaged 178. Will increase mill capacity to 200 tons when thoroughly adjusted.

Lander County

FARRETTA & CHILDRESS (Battle Mountain)—Operating cinnabar property in Jersey district 72 miles southwest of Battle Mountain; have completed addition to reduction plant, also bunk house, boarding house and office.

Mineral County

SIMON LEAD (Mina)—Crosscut on 400 level cut mixed lead-zinc sulphide oreshoot 35 ft. wide. Shoot developed on upper levels. Strong flow of water opened, valuable for milling.

SUMMERFIELD & ELGES (Mina)—Lessees have successfully developed Booth quicksilver mine. Installing two new retorts at reduction plant. Development pushed on Farnham & Drew property, and good tonnage commercial mercury ore blocked out. Lessees on Pepper & Keough shipping regularly.

Nye County

EAST DIVIDE (Divide)—Shaft down 150 ft. Sinking will continue.

GOLD ZONE (Divide)—Shaft sunk to 500 level and crosscutting to Divide vein under way.

HASBROUCK (Divide)—Long tunnel nearing objective. Shaft workings still in ore, and large tonnage of milling-grade ore developed.

TONOPAH EXTENSION (Tonopah)—Clean-up second week in December was 61,000 oz.

White Pine County

NEVADA CONSOLIDATED (Ely)—December production of copper was 5,800,000 pounds.

NEW MEXICO

Grant County

DUNCAN M. AND M. (P. O., Duncan, Ariz.)—Work started on first 80-ton unit of 500-ton cyanide mill for Mount Royal district of Grant County, New Mexico. Power to be installed for 125 tons. Primarily to treat ores from company's Golden Fleece mine. Latter has developed oreshoot 40 to 60 ft. wide and over 400 ft. deep of clean cyaniding ore. Recovery on mill tests 97-98% of gold and up to 90% of silver. Will mill 10 to 15 ft. of vein, which is high-grade milling ore, in first unit and take remainder when other units are built. Will also treat ore from six other properties within 2½-mile radius, all of which can be brought by aërial tramways. Water plentiful. Altitude of mill, 4500 ft. Roads good. Conditions for cheap operation good. Skilled Mexican labor readily secured.

SAN JOSE (Central)—Shipping high-grade copper-silver ore from 240 level.

ATWOOD (Lordsburg)—H. V. Snell and others will install new hoist on Southern group, intending to sink 300 ft. J. Tangye, superintendent.

BONNEY (Lordsburg)—Shipped 15 cars of ore to Copper Queen smeltery during December. Have completed exploration work for present, with 36,000 tons of ore in sight. Arrangements being made for 100-ton mill. Ore reserves average 2½% Cu and $3.77 precious metals. J. P. Porteus, general superintendent.

BOSTON-HECLA (Lordsburg)—Building four-mile wagon road from mine to Pyra station on Southern Pacific. R. E. Vandruff, manager.

BOUNDS (Lordsburg)—Two cars of fluorspar ready for shipment.

CAP-ROCK (Lordsburg)—Continues to mine manganese ore, grading 42% Mn and 2% silica; two cars ready to ship.

GREAT-EAGLE (Lordsburg)—Continues regular shipments of fluorspar. Preparing to run tunnel 300 ft. on orebody. Fred. Kroll, manager.

OCTO (Lordsburg)—Preparing to sink main shaft.

CHINO COPPER (Santa Rita)—December production of copper was 5,507,635 pounds.

AUSTIN-AMAZON (Silver City)—Large block of ore running 3% copper recently opened on this property in Burro Mountain district.

OKLAHOMA

Joplin District

IMPERIAL DEVELOPMENT (Miami)—Starting new shaft on Osage tract, where 18 months' fight against water was unavailing. Fight on water to be renewed soon.

LUCKY INDIAN (Quapaw)—Taken over by Municipal Excavator Co., of Oklahoma City, which will tram from shaft to Red Rose mill, a quarter-mile away.

THELMA JANE (Quapaw)—Has taken over Gander mine and will install 10 hand jigs.

UTAH

Salt Lake County

CARDIFF (Salt Lake City)—New oreshoot followed for 100 ft., a good deal being high-grade silver-lead ore. Shipments of 40 tons a day or 275 to 300 tons a week being made. Ore hauled on sleds in South Fork, and by trucks in main canyon, to Murray. Trucks haul six tons and make 1½ trips a day. Distance ore bins to Murray, 18 miles.

UTAH COPPER (Garfield)—December production of copper was 13,835,000 pounds.

CANADA

British Columbia

CONSOLIDATED M. AND S. CO. OF CANADA (Rossland)—Making progress in applying old treatment methods to Rossland ores. Methods old, but application is new as regards these ores. No definite announcement as yet.

Manitoba

REX (Herb Lake)—During November, company produced $5600 in gold. Shipments to Ottawa mint since June totaled $27,368.

Ontario

BOURKES (Bourkes Station)—New vein encountered at 100 level. Winze being sunk to 200 level.

BAILEY (Cobalt)—Toronto broker asking for proxies in effort to settle litigation of several years' standing. Proposal is to form new company called Bailey-Northern Customs, Ltd., with $1,250,000 capital and authorized bond issue of $150,000, which will buy out Northern Customs mill and give 425,000 shares in new company for Bailey.

CROWN RESERVE (Cobalt)—Development shows new discovery of increasing importance on 200 level. Drift on vein now in 100 ft., with high grade all the way. Vein in conglomerate.

LA ROSE (Cobalt)—Station cut at 470 level of Violet, where ore shows enrichment as compared with that on 370 level.

M'KINLEY DARRAGH (Cobalt)—Has discovered new high-grade vein on 300 level.

NIPISSING (Cobalt)—Was largest silver producer in 1918 in British Empire, with production of approximately 4,000,000 oz. Mining Corporation was close second.

TEMISKAMING (Cobalt)—Number of men laid off, shortage of power rendering curtailment necessary.

KIRKLAND TOWNSITE (Kirkland Lake)—Deal put through by English parties for control.

LAKE SHORE (Kirkland Lake)—In November, mill treated 1320 tons of ore, with recovery of $44,578, running 95.5% of possible running time.

OTISSE (Matachewan)—Heavy machinery arriving for sinking shaft to 500 feet.

CASTLE OIL AND GAS (Mosa)—Company has brought in two new wells and now has 16 producing in Mosa field. Starting several new wells.

HOLLINGER CONSOLIDATED (Timmins) — Planning extensive additional house accommodations for employees.

MEXICO

Sonora

GREENE CANANEA (La Cananea)—December production was 5,100,000 lb. copper, 174,900 oz. silver, and 1280 oz. gold.

PERU

Junin

CERRO DE PASCO (La Fundicion)—December production was 6,410,000 lb. of copper.

CHOSEN

ORIENTAL CONSOLIDATED (Unsan)—December clean-up yielded $124,000; ore above the average.

The Market Report

SILVER AND STERLING EXCHANGE

Jan.	Sterling Exchange	Silver New York, Cents	Silver London, Pence	Jan.	Sterling Exchange	Silver New York, Cents	Silver London, Pence
9	4.7580	101⅛	48 7/16	13	4.7575	101⅛	48 7/16
10	4.7580	101⅛	48 7/16	14	4.7580	101⅛	48 7/16
11	4.7580	101⅛	48 7/16	15	4.7575	101⅛	48 7/16

New York quotations are as reported by Handy & Harman and are in cents per troy ounce of bar silver, 999 fine. London quotations are in pence per troy ounce of sterling silver, 925 fine.

DAILY PRICES OF METALS IN NEW YORK

Jan.	Copper Electrolytic	Tin Spot.†	Lead N. Y.	Lead St. L.	Zinc St. L.
			5.75	5.60	7.20
9	*	68	@5.90	@5.70	@7.25
			5.70	5.50	7.15
10	*	67¼	@5.75	@5.60	@7.25
			5.60	5⅜	7.15
11	*	67¼	@5.65	@5⅜	@7.20
				5⅜	7.15
13	*	67¼	5¼	@5⅜	@7.20
			5.40	5.30	6.95
14	*	67¼	@5.50	@5.35	@7.05
			5.40	5.30	6¾
15	*	68	@5.50	@5.35	@7.00

The above quotations are our appraisal of the average of the major markets based generally on sales as made and reported by producers and agencies, and represent to the best of our judgment the prevailing values of the metals for the deliveries constituting the major markets, reduced to basis of New York, cash, except where St. Louis is the normal basing point.

Quotations for spelter are for ordinary Prime Western brands. We quote New York price at 35c. per 100 lb. above St. Louis.

* Undetermined.

† For American tin of 99% grade.

LONDON

Jan.	Copper Standard Spot	Copper Standard 3 M.	Copper Electrolytic	Tin Spot	Tin 3 M.	Lead Spot	Lead 3 M.	Zinc Spot
9	95	85	105	255	246½	40	33	56
10	94	84	105	252	243½	40	32½	56
11								
13	94	83½	105	255	246½	40	32½	56
14	94	83½	105	254	246½	40	32½	56
15	91	81	105	252	246	40	32½	56

The above table gives the closing quotations on London Metal Exchange. All prices are in pounds sterling per ton of 2240 lb.

Metal Markets

NEW YORK—Jan. 15, 1919

The metal markets this week were weak and disappointing. Lead failed to exhibit any stability following the little advance last week, and zinc, which has been declining for a long time, fell off sharply.

Copper—No material change developed from the situation of last week. The business that has been transacted so far since the first of the year has been almost entirely by the smaller producers. We said last week that at least three had been selling, but it appears that sales were made by at least six. We have direct reports from only a few of them, but we consider 15,000,000 lb. to be a liberal estimate of the total business done by them since Jan. 1. There has been very little reselling by consumers. The big producers have made no sales except a few at 23c., on which each seller guaranteed the price against himself. The total of such business was very small. Certain wire-drawers are quoting copper wire at 22½@23c., which, under present conditions, is probably not very different from 20c. for electrolytic wire bars.

During the present week the amount of business done by the small producers dwindled, and subsequent to Saturday we did not receive reports of anything being done by anybody. On Jan. 9-11 a few million pounds were sold at 20c. The market, if it be called such, continued so small and so vague that we are unable to determine a daily price as a matter of record. It is certain that some copper was sold on some days at 20c., that the big producers did nothing, that buyers were few, and that more copper was offered at 20c. than was sold, but, even so, it was doubtful whether any great quantity was to be had at that price.

Copper Sheets—The base price of copper sheets is 29c. per lb. Copper wire is quoted at 22½@23c. per lb. f.o.b. mill, carload lots.

Tin—There was very little business done. All that we heard of was in American tin. We did not hear of any Straits, Banka, or Chinese being offered.

The quotations for spot tin as given in the *Journal* of Jan. 11, for Jan. 6, 7, and 8 are in error. The corrected quotations are: Jan. 6, 68½; Jan. 7, 68½; Jan. 8, 68½.

Lead

Lead—This market was disappointing. After rallying to 5¾c. and exhibiting some stability for a few days, the interest of buyers waned, and sellers offered quantities at lower figures in order to make the metal move. Since Monday, lead has been offered freely at 5¼c. in such ways as to invite counter-bids, and, indeed, 5.40c. was accepted.

Zinc—The crumbling away in the price for spelter continued up to Jan. 14, when the metal was freely offered at sharp concessions, and a considerable business was done at 7c. for January delivery and 6¾c. for February. The ore situation in the Joplin district was an immediate factor, it being possible for smelters to buy ore on terms permitting sales at these figures and at the same time realize a profit.

Zinc Sheets—Unchanged at $13 per 100 lb.

Other Metals

Aluminum—Unchanged at 33c. per lb. It is said that offerings are being made at 32½c. Actual consumers are not making purchases.

Antimony—A fair amount of business was reported done at 7¼ cents.

Bismuth—Metal of the highest purity for pharmaceutical use is quoted at $3.50 per lb. for wholesale lots—500 lb. and over.

Cadmium—Quoted at $1.50@1.75 per pound.

Nickel—Market quotation: Ingot, 40c.; shot, 43c.; electrolytic, 45c. per pound.

Quicksilver—Dull at $110. No quotation received from San Francisco.

Silver and Platinum

Silver—The price of silver in London and New York remains unchanged at 48 7-16d. and $1.01⅛ per oz., respectively. Shipments to London for the week ended Jan. 11 were 527,000 oz. The volume of bullion going forward to the East via San Francisco continues large, but figures for recent shipments are not yet available.

Mexican dollars at New York: Jan. 9, 77⅜; Jan. 10, 77⅜; Jan. 11, 77⅜; Jan. 13, 77⅜; Jan. 14, 77⅜; Jan. 15, 77⅜.

Platinum—Refined ingot quoted at $105.

Palladium—Unchanged at $125.

Zinc and Lead Ore Markets

Joplin, Mo., Jan. 11—Blende, per ton high, $52.50; basis 60% zinc, premium, $50; Class B and Prime Western, $45@42.50; sludge and flotation, $42.50@40@37.50; calamine, basis 40% zinc, $35@30. Average selling prices: blende, $43.05; calamine, $35.60; all zinc ores, $42.77.

Lead, high, $82.10; basis 80% lead, $65@60; average selling price, all grades of lead, $63.66 per ton.

Shipments the week: Blende, 11,366; calamine, 447; lead, 987 tons. Value, all ores the week, $568,300.

All the large producing mines are again running full day shifts, but none at night. All mines are running that can afford to run and make the slightest profit.

Platteville, Wis., Jan. 11—Blende, basis 60% zinc, $50 per ton base for premium grade; $45 base for high-lead blende. Lead ore, basis 80% lead, $56 to $60 per ton. Shipments reported for the week were 1340 tons blende, 40 tons galena, and no sulphur ore. For two weeks of the year to date the totals are 2380 tons blende, 74 tons galena, and no sulphur ore. During the week 2281 tons blende was shipped to separating plants.

Other Ores

Chrome Ore—Some inquiries for future deliveries are mentioned.

Manganese Ore—Foreign ore is now being offered.

Molybdenum Ore—Considerable business was done in 5- and 10-ton lots, for the first time in many weeks. Prices ranged from 75 to 85 cents.

Tungsten Ore—No business was reported but it is probable that ore of good grade could be bought at $15.

Pyrites—Spanish pyrites is quoted, subject to the raising of the embargo, at 16½c. on the basis of 10s. ocean freight. Restrictions still continue. Unchanged. Ocean freight is now 30s. or less per long ton.

Iron Trade Review

New York, Jan. 15

An incomplete analysis indicates that the aggregate of peace-time buying is larger than generally supposed. No attempt is made to express it in figures, but in spite of good shipments in December the bookings on Jan. 1 were probably less than 10 per cent. below those of Dec. 1. Mills have meanwhile worked into the backlog which is usually so desirable for an efficient operating régime. Generally the producer describes conditions as better than expected. The trade, according to *Iron Age*, has been so long used to full steam activity that it is not yet accustomed to the present period of low demand.

With operations not quite so good as a week ago, it is to be expected that reports are numerous of plant shutdowns. The industry cannot, of course, expect 60 per cent. operation and not have idleness. A surplus of labor has already become apparent at steel works, with offers to work at lower than existing wage schedules.

The December estimated output of steel ingots, 2,992,306 tons, is, with the same number of working days, only 2 per cent. less than the November production and there was no noticeable stocking of the rolled product, a fact which is favorable.

Inquiries of a promising nature are appearing from Belgium, though likely for British negotiation. Fresh export inquiries here include 3000 tons of light rails and 1500 tons of ties for portable tracks, and one of 500 tons of standard rails for Spain.

The drop in prices has been accepted in spots in the foundry trade, as instanced by a 25 per cent. cut by radiator makers and some recessions in malleable casting prices. Guidance in respect to prices on old contracts is expected from a meeting of pig iron producers in Pittsburgh on Jan. 15.

PITTSBURGH—Jan. 14

In many respects conditions in the iron and steel industry parallel those which obtained during the early months of 1908, following the panic of October, 1907. The one conspicuous difference is that there is no question about credits. There is practically no new buying, and furnaces and mills are operating on old orders, but are not able to ship against the full volume of business they have on books, because many buyers are seeking cancellation of contracts or postponement of deliveries. Instead of business picking up, producers are gradually running out of orders, and the rate of production is decreasing rather than increasing.

The monthly statistics of steel-ingot production show a slightly heavier rate of ingot output in December than in November, but this is no criterion for the present. The shipments of finished steel in December probably fell off, and much of the tonnage shipped was against long accumulating requirements of jobbers and manufacturing consumers, which do not represent any prolonged demand. In many cases, also, mills were able to make shipments because buyers did not realize the sudden change in conditions and were taken by surprise with the quantity of steel shipped them. Steel production in November and December was about 88% of capacity, and production this week is estimated at about 65%, and the present outlook is that a rate of 50% or even less may be attained in a few weeks. There are no buyers of steel, either by way of making fresh commitments or of specifying against old contracts, except those who can turn the material over at once, among whom are jobbers who have immediate sale for the material and automobile makers who can sell their cars as fast as made.

Irrespective of prices ruling for steel, no construction work is in prospect, because investors must be satisfied as to the stability of conditions and are awaiting lower costs of labor and commodities other than steel. The common opinion is that before investors take hold in the matter of putting up bridges, buildings, factories, and new construction generally, the peace treaty must be signed and the Bolshevik menace completely removed.

Steel mills have been offered scrap at $10 a ton below former prices, but will not buy even small lots, whereas they have reduced their finished products only about $4 a ton. The common interpretation is that they have no confidence in their quoted prices as a sales proposition, but are holding them so that holders of contracts will specify against the contracts.

Pig Iron—A few furnaces have refused to reduce their quotations $3 a ton, as suggested, but the majority are disposed to revise contracts by this amount, and, even with such revision, consumers are indisposed to accept full contract tonnages. On account of present high costs, furnaces are indisposed to store iron, and a number will probably have to go out of blast. This may make for labor efficiency when they resume. There is no thought of reducing wage rates. The market is quotable at $3 under Government prices: Bessemer, $32.20; basic, $30; No. 2 foundry, $31; malleable, $31.50; forge, $30, f.o.b. Valley furnaces, freight to Pittsburgh being $1.40.

Steel

Steel—Regular quotations on soft steel are: Billets, $43.50; sheet bars and small billets, $47; slabs, $46; rods, $57. Excepting rods, which are unchanged, these prices are $4 under the old Government prices. They are purely nominal as a market proposition, however, there being no buying. The British government is offering regular shell steel, in billet form and in rounds, at prices said to be $27 to $28, yet there is scarcely any material moving. Discard steel is offered at about the same level, but would not be as attractive as the regular shell steel which has passed inspection. The U. S. Government will have much material of these classes to sell, but is holding off, awaiting a market with more absorbing power.

Ferroalloys

Ferromanganese—It is practically impossible to sell ferromanganese or spiegeleisen at any price. Producers recently reduced their nominal quotations to $225, delivered, for 70% ferromanganese and $65, furnace, for 16% spiegeleisen. Consumers are seeking cancellation of contracts and would not be content with an adjustment on the basis of these reduced prices.

Coke—Though coke production has increased little, supplies are proving more nearly adequate, and furnaces are content with the quantity of coke received, but in many cases not with the quality, which still leaves much for improvement. The Fuel Administration price limits of $6 on furnace and $7 on foundry coke will continue at least to Feb. 1 and perhaps to Apr. 1. There is no longer any prospect of an advance in the market if the control were removed.

MONTHLY AVERAGE PRICES OF METALS

Silver	New York			London		
	1916	1917	1918	1916	1917	1918
Jan.	56.775	75.630	88.702	26.960	36.682	44.356
Feb.	56.755	77.585	85.716	26.975	37.742	42.792
Mar.	57.935	73.861	88.082	27.597	36.410	43.620
April	64.415	73.875	95.346	30.662	36.963	47.215
May	74.269	74.745	99.505	35.477	37.940	48.980
June	65.024	76.971	99.500	31.060	39.065	48.875
July	62.940	79.010	99.625	30.000	40.110	48.813
Aug.	66.083	85.407	100.292	31.498	43.418	49.077
Sept.	68.515	100.740	101.125	32.584	50.920	49.500
Oct.	67.855	87.332	101.125	32.361	44.324	49.500
Nov.	71.604	85.891	101.125	34.192	43.584	48.969
Dec.	75.765	85.960	101.125	36.410	43.052	48.492
Year.	65.661	81.417	96.772	31.315	40.851	47.516

New York quotations cents per ounce troy, fine silver; London, pence per ounce, sterling silver, 925 fine.

Copper	New York		London			
	Electrolytic		Standard		Electrolytic	
	1917	1918	1917	1918	1917	1918
Jan.	28.673	23.500	131.921	110.000	142.895	125.000
Feb.	31.750	23.500	137.895	110.000	148.100	125.000
Mar.	31.481	23.500	136.750	110.000	151.000	125.000
April.	27.935	23.500	133.842	110.000	147.158	125.000
May	28.788	23.500	130.000	110.000	142.000	125.000
June.	29.962	23.500	130.000	110.000	142.000	125.000
July.	26.620	25.904	128.409	119.913	140.409	134.913
Aug.	25.380	26.000	122.391	122.000	137.000	137.000
Sept.	25.073	26.000	117.500	122.000	135.250	137.000
Oct.	23.500	26.000	110.000	122.000	125.000	137.000
Nov.	23.500	26.000	110.000	122.000	125.000	137.000
Dec.	23.500	(a)	110.000	118.447	125.000	.....
Year	27.180	24.628	124.892	115.530	138.401	.....

(a) No Market.

Tin	New York		London	
	1917	1918	1917	1918
January	44.175	85.500	185.813	293.227
February	51.420	92.000	198.974	311.525
March	54.388	(a)	207.443	318.875
April	55.910	(a)	220.171	329.905
May	63.173	(a)	245.114	364.217
June	62.053	(a)	242.083	331.925
July	62.570	(a)	242.181	360.347
August	62.681	(a)	243.978	380.900
September	61.542	(a)	244.038	343.905
October	61.851	(a)	247.467	335.543
November	74.740	(a)	274.943	323.550
December	87.120	(a)	298.556	267.736
Av. year	61.802	88.750	237.563	330.138

(a) No average computed.

Lead	New York		St. Louis		London	
	1917	1918	1917	1918	1917	1918
January	7.626	6.782	7.530	6.684	30.500	29.00
February	8.636	6.973	8.595	6.899	30.500	29.00
March	9.199	7.201	9.120	7.091	30.500	29.00
April	9.288	6.772	9.158	6.701	30.500	29.00
May	10.207	6.818	10.202	6.704	30.500	29.00
June	11.171	7.611	11.123	7.511	30.500	29.00
July	10.710	8.033	10.644	7.750	30.500	29.00
August	10.594	8.050	10.518	7.750	30.500	29.00
September	8.680	8.050	8.611	7.750	30.500	29.00
October	6.710	8.050	6.650	7.750	30.500	29.00
November	6.249	8.050	6.187	7.750	30.500	31.20
December	6.375	6.564	6.312	6.324	30.500	40.00
Year	8.787	7.413	8.721	7.222	30.500	30.10

Spelter	New York		St. Louis		London	
	1917	1918	1917	1918	1917	1918
January	9.619	7.836	9.449	7.661	48.329	54.000
February	10.045	7.814	9.875	7.639	47.000	54.000
March	10.300	7.461	10.130	7.286	47.000	54.000
April	9.459	6.890	9.289	6.715	54.632	54.000
May	9.362	7.314	9.192	7.114	54.000	54.000
June	9.371	8.021	9.201	7.791	54.000	54.000
July	8.643	8.688	8.473	8.338	54.000	54.000
August	8.360	8.985	8.190	8.635	54.000	54.000
September	8.136	9.442	7.966	9.092	54.000	54.000
October	7.983	8.801	7.813	8.451	54.000	54.000
November	7.847	8.491	7.672	8.141	54.000	54.100
December	7.685	8.163	7.510	7.813	54.000	56.050
Year	8.901	8.159	8.813	7.890	52.413	54.180

New York and St. Louis quotations, cents per pound. London, pounds sterling per long ton.

Pig Iron, Pgh.	Bessemer‡		Basic‡		No. 2 Foundry	
	1917	1918	1917	1918	1917	1918
January	$35.95	$37.25	$30.95	$33.95	$30.95	$33.95
February	36.37	37.25	30.95	33.95	30.95	33.95
March	37.37	37.25	33.49	33.95	35.91	33.95
April	42.23	36.15	38.90	32.95	40.06	33.95
May	46.94	36.20	42.84	33.00	43.60	34.00
June	54.22	36.36	50.05	33.16	50.14	34.16
July	57.45	36.60	53.80	33.40	53.95	34.40
August	54.17	36.60	50.37	33.40	53.95	34.40
September	46.40	36.60	42.24	33.40	48.58	34.40
October	37.25	36.60	33.95	34.40	33.95	35.40
November	37.25	36.60	33.95	34.40	33.95	35.40
December	37.25	36.60	33.95	34.40	33.95	35.40
Year	$43.57	36.67	$39.62	33.70	$40.83	34.45

‡ As reported by W. P. Snyder & Co.

STOCK QUOTATIONS

N. Y. EXCH.†	Jan. 14
Alaska Gold M.	3⅛
Alaska Juneau	2·
Am.Sm.&Ref.,com.	72⅛
Am.Sm. & Ref., pf.	107
Am.Sm.Sec., pf., A.	92
Am. Zinc	11⅛
Am. Zinc, pf.	42
Anaconda	60
Batopilas Min.	1⅛
Bethlehem Steel	57⅛
Butte & Superior	18⅛
Butte Cop. & Zinc	6⅛
Cerro de Pasco	34
Chile Cop.	17⅛
Chino	34
Colo. Fuel & Iron	35
Crucible Steel	86⅛
Crucible Steel, pf.	91⅛
Dome Mines	11⅛
Federal M. & S.	10
Federal M. & S., pf.	36⅛
Greater Nor., ore ctf	35⅛
Greene Cananea	43⅛
Gulf States Steel	60
Homestake	94
Inspiration Con.	43⅞
International Nickel	29⅛
Kennecott	32⅛
Lackawanna Steel	64⅛
Mexican Petrol.	182
Miami Copper	24⅛
Nat'l Lead, com.	64⅛
National Lead, pf.	108
Nev. Consol.	16⅞
Ontario Min.	6
Ray Con.	20⅛
Republic I.&S., com.	73⅛
Republic I.&S., pf.	100
Sloss-Sheffield	49⅛
Tennessee C. & C.	13⅛
U. S. Steel, com.	91
U. S. Steel, pf.	114⅞
Utah Copper	71⅛
Va. Iron C. & C.	57⅛

BOSTON CURB*	Jan. 14
Alaska Mines Corp.	‡.12
Boston Ely	.92
Boston & Mont.	.50
Butte & Lon'n Dev.	.14
Calaveras	1⅛
Chief Con.	3⅛
Contact	‡.05
Corbin	‡.25
Cortez	.12
Crown Reserve	.34
Crystal Cop.	.18
Eagle & Blue Bell	2⅛
First Nat. Cop.	‡2⅛
Houghton Copper	.30
Intermountain	‡.05
Iron Blossom	.45
Iron Cap.	15⅛
Majestic	.22
Mexican Metals	.27
Mines of America	‡.75
Mojave Tungsten	.05
Nat. Zinc & Lead	.09
Nevada-Douglas	.36
New Baltic	1
New Cornelia	‡16
Oneco	.20
Pacific Mines	‡.35
Rex Cons.	‡.05
Yukon Gold	.80

SAN FRAN.*	Jan. 14
Alta	.02
Andes	.04
Best & Belcher	‡.01
Caledonia	.02
Challenge Con.	.03
Confidence	‡.05
Con. Virginia	‡.05
Gould & Curry	‡.01
Hale & Norcross	‡.01
Jacket-Cr. Pt.	‡.06
Mexican	.10
Occidental	.40
Ophir	.01
Overman	.01
Savage	.02
Sierra Nevada	.06
Union Con.	.10
Utah Con.	‡.01
Belmont	2.65
Jim Butler	.32
MacNamara	.29
Midway	.25
Mont.-Tonopah	.14
North Star	.06
Rescue Eula	.07
West End Con.	1.22½
Atlanta	.04
Booth	.13
Comb. Frac.	‡.02
Florence	.12
Jumbo Extension	.14
Kewanas	.06
Nevada Hills	.03
Nevada Packard	‡.31
Round Mountain	.25
Silver Pick	.05
White Caps	.16

COLO. SPRINGS*	Jan. 14
Cresson Con.	4.93⅛
Doctor Jack Pot	.04⅛
Elkton Con.	.05
El Paso	.14
Gold Sovereign	‡.02
Golden Cycle	1.75
Granite	.20
Isabella	.06⅛
Mary McKinney	.08
Portland	1.00
United Gold M.	.15
Vindicator	.39

BOSTON EXCH.†	Jan. 14
Adventure	‡.60
Ahmeek	.71
Algomah	‡.30
Allouez	42½
Ariz. Com.	11⅛
Arnold	‡.20
Bingham Mines	‡9⅛
Bonanza	‡.10
Butte-Balakiava	.21
Calumet & Aris	60
Calumet & Hecla	‡426
Centennial	13
Copper Range	41⅛
Daly West	‡2⅛
Davis-Daly	‡5
East Butte	5·
Franklin	3⅛
Granby	‡79
Hancock	15
Hedley	‡12
Helvetia	‡.20
Indiana	‡.80
Isle Royale	25⅛
Keweenaw	‡1
Lake	5
La Salle	‡3
Mason Valley	‡2⅛
Mass	‡4
Mayflower	‡3
Michigan	3
Mohawk	53⅛
New Arcadian	1⅛
New Idria	‡10
North Butte	10⅛
North Lake	‡.55
Ojibway	‡1⅛
Old Dominion	35⅛
Osceola	52
Quincy	‡59⅛
St. Mary's M. L.	42
Santa Fe	‡.25
Seneca	‡15⅛
Shannon	12⅛
Shattuck-Ariz.	‡14⅛
So. Lake	1
So. Utah	‡.10
Superior	‡5⅛
Superior & Bost.	2⅛
Trinity	‡2⅛
Tuolumne	‡.77
U. S. Smelting	44
U. S. Smelting, pf.	45
Utah Apex	3⅛
Utah Con.	8
Utah Metal	1⅛
Victoria	1⅛
Winona	‡.90
Wolverine	18⅛
Wyandot	‡.50

N. Y. CURB†	Jan. 14
Big Ledge	⅜
Butte & N. Y.	⅛
Butte Detroit	‡.02
Caledonia	.29
Calumet & Jerome	⅛
Can. Cop. Corpn.	2
Carlisle	‡2
Cashboy	‡.08
Con. Ariz. Sm.	1⅛
Con. Coppermines	5⅛
Goldfield Con.	.23
Goldfield Merger	.06
Greenmonster	⅛
Hecla Min.	⅛
Howe Sound	‡4
Jerome Verde	‡.50
Louisiana	⅛
Magma	‡25
Marsh	.04⅛
McKinley-Dar-Sa.	‡.47
Milford	‡.75
Mother Lode	.35
Nixon Nevada	.44
Ohio Cop.	‡.75
Rawley	‡2⅛
Ray Hercules	2⅛
Richmond	‡.56
Rochester Mines	.27
St. Joseph Lead	‡11
Standard S. L.	.25
Stewart	‡.16
Success	.05⅛
Tonopah	‡3⅛
Tonopah Ex.	2⅛
Tribullion	‡1⅛
Troy Arizona	‡.10
United Eastern	‡4⅛
United Verde Ext.	‡35⅛
United Zinc	‡⅛
Utica Mines	‡.08

TORONTO*	Jan. 14
Adanac	.08
Bailey	.04
Beaver Con.	.40
Chambers Ferland	.08
Coniagas	‡2.00
Hargraves	.02⅛
Kerr Lake	‡5.37½
La Rose	.25
Lake Shore	.90
Min. Corp. of Can.	2.25
Nipissing	‡8.75
Peterson Lake	.10
Temiskaming	.30
Wettlaufer-Lor.	.03
Davidson	‡.60
Dome Exten.	.22
Dome Lake	.17
Hollinger	6.12½
McIntyre	1.75
Newray	.12⅛
Porcu. Crown	.28
Teck-Hughes	.25
Vipond	.20
West Dome	.14

* Bid prices. † Closing prices. ‡ Last quotations.

Current Prices—Materials and Supplies

IRON AND STEEL

SHEETS—Quotations are in cents per pound in various cities from warehouse, also the base quotations from mill:

Blue Annealed	Large Mill Lots Pittsburgh	St. Louis	Chicago	San Francisco	New York Current	New York One Yr. Ago
No. 10	3.90	5.52	5.52	6.55	5.17	5.44½
No. 12	3.95	5.57	5.57	6.60	5.22	5.49½
No. 14	4.00	5.62	5.62	6.70	5.27	5.54½
Black						
Nos. 18 and 20	4.50	6.32	6.32	7.30	5.92	6.24½
Nos. 22 and 24	4.55	6.37	6.37	7.35	5.97	6.29½
No. 26	4.60	6.42	6.42	7.40	6.02	6.43½
No. 28	4.70	6.52	6.52	7.50	6.22	6.53½
Galvanized:						
No. 10	5.05	6.97	6.77	....	6.42	6.69½
No. 12	5.15	6.97	6.87	7.85	6.52	6.79½
No. 14	5.15	6.97	6.87	8.00	6.67	6.79½
Nos. 18 and 20	5.45	7.17	7.17	8.15	6.97	7.09½
Nos. 22 and 24	5.60	7.32	7.32	8.30	7.02	7.24½
No. 26	5.75	7.47	7.47	8.45	7.17	7.39½
No. 28	6.05	7.77	7.77	8.75	7.57	7.69½

STEEL RAILS—The following quotations are per gross ton f.o.b. Pittsburgh and Chicago for carload or larger lots. For less than carload lots 5c. per 100 lb. is charged extra:

	Pittsburgh Current	Pittsburgh One Year Ago	Chicago Current	Chicago One Year Ago
Standard bessemer rails	$55.00	$38.00	$65.00	$38.00
Standard openhearth rails	57.00	40.00	67.00	40.00
Light rails, 8 to 10 lb	3.13½*	83.00	3.13½*	68.00
Light rails, 12 to 14 lb	3.09*	82.00	3.09*	67.00
Light rails, 25 to 45 lb	3.00*	75.00	3.00*	65.00

* Government price per 100 lb.

TRACK SUPPLIES—The following prices are base per 100 lb. f. o. b. Pittsburgh for carload lots, together with the warehouse prices at the places named:

	Pittsburgh Current	Pittsburgh One Year Ago	Chicago	St. Louis	San Francisco
Standard railroad spikes, ⅜-in. and larger	$3.90	$5.00	$4.50	$5.30	$6.70
Track bolts	4.90	6.25	5.50	Premium	8.00
Standard section angle bars	3.25	3.65	4.45	Premium	5.15

STRUCTURAL MATERIAL—The following are the base prices f. o. b. mill, Pittsburgh, together with the quotations per 100 lb. from warehouses at the places named:

	Mill, Pittsburgh	New York Current	New York 1 Yr. Ago	St. Louis	Chicago	San Francisco	Dallas
Beams, 3 to 15 in.	$3.00	$4.27	$5.25	$4.27	$4.27	$5.25	$5.05
Channels, 3 to 15 in.	3.00	4.27	5.25	4.27	4.27	5.25	5.05
Angles, 3 to 6 in. ¼ in. thick	3.00	4.27	5.25	4.27	4.27	5.25	5.05
Tees, 3 in. and larger	3.00	4.27	5.30	4.27	4.27	5.25	5.05
Plates	3.25	4.52	10.00	4.52	4.52	5.50	5.28

STEEL SHEET PILING—The following price is base per 100 lb. f. o. b. Pittsburgh, with a comparison of a month and a year ago:

Current	One Month Ago	One Year Ago
$4–5	$4–5	$4.50

RIVETS—The following quotations are per 100 lb.:

	Mill Pittsburgh	New York Current	New York One Year Ago	Chicago	St. Louis	San Francisco	Dallas
STRUCTURAL — Warehouse							
½-in. and larger	$4.65	$5.675	$7.00	$5.57	$5.55	$6.70	$7.00
CONE HEAD BOILER							
½ in. and larger	4.75	5.775	7.10	5.67	5.65	6.80	7.10
½ and ⅝	4.90	5.925	7.25	5.82	5.80	6.95	7.25
½ and ⅝	5.25	6.275	7.60	6.17	6.05	7.30	7.60

Lengths shorter than 1 in. take an extra of 50c. Lengths between 1 in. and 2 in. take an extra of 25c.

WIRE ROPE—Discounts from list price on regular grades of bright and galvanized are as follows:

	New York and St. Louis
Galvanized iron rigging	+17½%
Galvanized cast steel rigging	2½%
Bright plow steel	30%
Bright cast steel	17½%
Bright iron and iron tiller	List

HORSE AND MULE SHOES—Warehouse prices per 100 lb. in cities named:

	Mill Pittsburgh	Cincinnati	Chicago	St. Louis	Denver	Birmingham
Straight	$6.25	$7.25	$6.50	$6.25	$8.00	$7.25
Assorted	6.40	7.75	6.50	6.40	8.25	7.50

BAR IRON AND STEEL—Per pound to large buyers at mill, Pittsburgh

Iron bars 3.5c. Steel bars 2.90c.

COAL BIT STEEL—Warehouse price per pound is as follows:

New York	Cincinnati	Birmingham	St. Louis	Denver	Chicago
$0.12	$0.16½	$0.18	$0.19	$0.18½	0.16½

DRILL STEEL—Warehouse price per pound:

	New York	St. Louis	Birmingham	Denver
Solid	6c.	14c.	15c.	16c.
Hollow	4c.	25c.	...	28c.

STEEL AND IRON PIPE—The following discounts are for carload lots f.o.b. Pittsburgh, basing card of Jan. 1 for steel pipe and iron pipe:

Inches	Steel Black Per Cent.	Galvanized Per Cent.	Inches	Iron Black Per Cent.	Galvanized Per Cent.
BUTT WELD					
¼ to 3	54	40½	¼ to 1¼	36	20
LAP WELD					
2	47	34½	1¼	21	6
2½ to 6	50	37½	1½	28	14
7 to 12	47	33½	2	29	15
13 and 14	37½	..	2½ to 6	31	18
15	35	..	7 to 12	28	15
BUTT WELD, EXTRA STRONG PLAIN ENDS					
¼ to 1¼	52	39½	¼ to 1¼	36	21
2 to 3	53	40½			
LAP WELD, EXTRA STRONG PLAIN ENDS					
2	45	33½	1½	22	7
2½ to 4	48	36½	1½	28	14
4½ to 6	47	35½	2	30	17
7 to 8	43	29½	2½ to 4	32	20
9 to 12	38	24½	4½ to 6	31	19
			7 to 8	23	11
			9 to 12	18	6

From warehouses at the places named the following discounts hold for steel pipe:

	Black New York	Black Cleveland	Black Chicago
¼ to 3 in. butt welded	40%	43%	41.1%
3½ to 6 in. lap welded	36%	39%	37.1%
	Galvanized New York	**Galvanized Cleveland**	**Galvanized Chicago**
¼ to 3 in. butt welded	28%	28%	26.1%
3½ to 6 in. lap welded	25%	25%	23.1%

Malleable fittings, Class B and C, from New York stock sell at list plus 15%. Cast iron, standard sizes, 5%.

NUTS—From warehouse at the places named, on fair-sized orders, the following amount is deducted from list:

	New York Current	New York One Year Ago	Cleveland Current	Cleveland One Year Ago	Chicago Current	Chicago One Year Ago
Hot pressed square	$0.80	List	$1.25	$1.40	$0.98	$1.05
Hot pressed hexagon	.80	List	1.05	1.20	.78	.85
Cold punched square	2.50*	List	.75	.75	1.00	1.50
Cold punched hexagon	2.50*	List	.75	75	1.00	1.50

* List plus.

Semifinished nuts sell at the following discounts from list price:

	Current	One Year Ago
New York	50–10%	50%
Chicago	50%	45%
Cleveland	50–10%	50%

MACHINE BOLTS—Warehouse discounts in the following cities:

	New York	Cleveland	Chicago
¾ by 4 in. and smaller	40–10%	40–10%	40%
Larger and longer up to 1 in. by 30 in.	20–5%	20–5%	25—5%

WASHERS—From warehouses at the places named the following amount is deducted from list price:

For wrought-iron washers:

New York $2.00 Cleveland $1.25 Chicago $1.75

For cast-iron washers the base price per 100 lb. is as follows:

New York $6.00 Cleveland $4.25 Chicago $4.50

CONSTRUCTION MATERIALS

ROOFING MATERIALS—Prices per ton f.o.b. New York and Chicago:

	Carload Lots N. Y.	Carload Lots Chicago	Less Than Carload Lots N. Y.	Less Than Carload Lots Chicago
Tar felt (14 lb. per square of 100 sq.ft.)	$64.00	$57.00	$65.00	$58.00
Tar pitch (in 400-lb. bbl.)	21.00	18.00	22.00	19.00
Asphalt pitch (in barrels)	36.00	36.00	41.50	41.50
Asphalt felt	67.50	67.50	72.00	72.00

PREPARED ROOFINGS—Standard grade rubbered surface, complete with nails and cement, costs per square as follows in New York, St. Louis, Chicago and San Francisco:

	1-Ply e.l.	1-Ply l.cl.	2-Ply e.l.	2-Ply l.cl.	3-Ply e.l.	3-Ply l.cl.
No. 1 grade	$1.35	$1.60	$1.70	$1.95	$2.05	$2.30
No. 2 grade	1.20	1.45	1.50	1.75	1.80	2.05

Asbestos asphalt-saturated felt (14 lb. per square) costs $5.00 per 100 lb.

Slate-surfaced roofing (red and green) in rolls of 108 sq.ft. costs $2.10 per roll in carload lots and $2.35 for smaller quantities.

Shingles, red and green slate finish, cost $5.50 per square in carloads, $5.75 in smaller quantities, in Philadelphia.

HOLLOW TILE—

	4 x 12 x 12	8 x 12 x 12	12 x 12 x 12
St. Paul	$.056	$0.11	$0.162
Cincinnati	.086	.165	.218
Seattle	.09	.175	.30
Los Angeles*	.079	.144	.181
New Orleans	.14	.20	.29

* F.o.b. factory, 4, 8 and 10 inch.

LUMBER—Price per M in carload lots:

	8 x 8-In. x 20 Ft. and Under				12 x 12-In. 20 Ft. and Under	
	Y. P.	Fir	Hemlock	Spruce	Y.P.	Fir
Cincinnati	$42.00	.....	$38.00	$41.00	$37.00	$39.00
Kansas City	39.00	40.50	$40.50	38.50	45.50	42.50
Seattle	19.50	19.50	29.50	19.50	19.50	19.50
New Orleans	45.00	.....	.....	.....	50.00	.....
St. Paul	.....	52.00	48.00	48.00	.....	48.50
Denver	43.00	33.50	.....	.....	48.00	39.00
Los Angeles	*	*	*	*	*	*

	1-In. Rough, 10 In. x 16 Ft. and Under			2-In. T. and G. 10 In. x 16 Ft.	
	Y.P.	Fir	Hemlock	Y.P.	Fir
Cincinnati	.....	$35.00	.....	$40.00	$39.00
Kansas City	$46.00	54.75	$54.75	53.50	60.00
Seattle	19.50	19.50	19.50	19.50	19.50
New Orleans	52.00	.....	.....	60.00	.....
St. Paul	62.50	48.00	43.00	.....	48.50
Denver	43.25	32.50	32.50	35.00	31.00
Los Angeles	39.00	33.00	34.00	*	*

* Los Angeles: Base price of fir is $32; of hemlock, $34; redwood, $35.

NAILS—The following quotations are per keg from warehouse:

	Mill Pittsburgh	St. Louis	Dallas	Chicago	San Francisco
Wire	$3.50	$4.37	$4.75	$4.32	$5.35
Cut	4.00	6.50	....	6.50	6.75

PORTLAND CEMENT—These prices are for barrels in carload lots, including bags:

	Current	One Month Ago	One Year Ago
New York	$4.00	$4.00	$2.22
Jersey City	3.64	3.64	2.16
Boston	3.67	3.67	2.37
Chicago	3.05	3.05	2.21
Pittsburgh	3.15	3.15	2.31
Cleveland	3.32	3.32	2.44
Denver	3.67	3.67	3.20

LIME—Warehouse prices:

	Hydrated per Ton		Lump per 300-Lb. Barrel	
	Finished	Common	Finished	Common
New York	$17.50	$14.50	$2.90	$2.65
Chicago	18.00	17.50	1.80*	1.10*
St. Louis	22.00	16.00	.....	1.75
Boston	22.20	18.20	3.65	3.35
Dallas	16.50	.....	.....	2.50
San Francisco	20.00	.....	.....	2.15
St. Paul	25.00	19.00	1.97*	1.93*
New Orleans	19.74	16.45	19.47‡	19.27‡
Cincinnati	14.20	11.95	.....	.....
Denver	.....	26.25‡	.....	2.50*
Los Angeles	.....	.....	.....	2.50*

* 200-lb. barrels. ‡ Per ton.

Note—Refund of 10c. per bag, amounting to $2 per ton; barrel refund is 10c.

LINSEED OIL—These prices are per gallon:

	New York		Cleveland		Chicago	
	Current	One Year Ago	Current	One Year Ago	Current	One Year Ago
Raw per barrel	$1.59	$1.28	$1.90	$1.30	$1.77	$1.26
5-gal. cans	1.84	1.38	2.00	1.40	1.97	1.35

WHITE AND RED LEADS in 500-lb. lots sell as follows in cents per pound:

	Red				White			
	Current		1 Year Ago		Current		1 Yr. Ago	
	Dry	In Oil	Dry	In Oil	Dry and In Oil		Dry and In Oil	
100-lb. keg	14.00	14.50	12.25	12.50	14.00	12.50		
25- and 50-lb. kegs	14.25	14.75	12.50	12.75	14.25	12.75		
12½-lb. keg	14.50	15.00	12.75	13.00	14.50	13.00		
5-lb. cans	.....	.....	14.25	14.00	16.00	14.50		
1-lb. cans	.....	.....	14.25	14.50	17.00	14.50		

MINING AND MILLING SUPPLIES

HOSE—

	Fire	
		50-Ft. Lengths
Underwriters' 2½-in.		85c. per ft.
Common, 2½-in.		40½%

	Air		
	First Grade	Second Grade	Third Grade
¼-in. per ft.	$0.60	$0.35	$0.30

Steam—Discounts from List

First grade..... 25% Second grade.....30% Third grade.....40%

LEATHER BELTING—Present discounts from list in the following cities are as follows:

	Medium Grade	Heavy Grade
New York	40%	35%
St. Louis	40+5%	35%
Chicago	45%	40+5%
Birmingham	35%	35%
Denver	40%	30%
Cincinnati	40—10%	40%

RAWHIDE LACING—40—5% off list.

MANILA ROPE—For rope smaller than ¼-in. the price is ¼ to 2c. extra; while for quantities amounting to less than 600 ft. there is an extra charge of 1c. The number of feet per pound for the various sizes is as follows: ¼-in., 8 ft., ⅜-in., 6; ½-in., 4½; ⅝-in., 3½; ¾-in., 2 ft. 10 in.; 1-in., 2 ft. 4 in. Following is price per pound for ¼-in. and larger, in 1200-ft. coils:

Boston	$0.25	Denver	$0.26
New York	.23	Kansas City	.22½
Cincinnati	.23½	New Orleans	.23
Chicago	.21½	Los Angeles	.24
St. Paul	.24	Seattle	.24
San Francisco	.22	St. Louis	.22½

PACKING—Prices per pound:

Rubber and duck for low-pressure steam	$0.95
Asbestos for high-pressure steam	1.76
Duck and rubber for piston packing	1.10
Flax, regular	.99
Flax, waterproofed	1.21
Compressed asbestos sheet	1.10
Wire insertion asbestos sheet	1.30
Rubber sheet	.66
Rubber sheet, wire insertion	.99
Rubber sheet, duck insertion	.55
Rubber sheet, cloth insertion	.25
Asbestos packing, twisted or braided and graphited, for valve stems and stuffing boxes	1.21
Asbestos wick, ¼- and 1-lb. balls	.75

REFRACTORIES—Following prices are f. o. b. works, Pittsburgh:

Chrome brick	net ton	$120.00 at Chester, Penn.
Chrome cement	net ton	65.00 at Chester, Penn.
Clay brick, 1st quality fireclay	net ton	40–30 at Clearfield, Penn.
Clay brick, 2nd quality	net ton	38–48 at Clearfield, Penn.
Magnesite, dead burned	net ton	37.50 at Chewalah, Penn.
Magnesite brick, 9 x 4½ x 2½ in.	net ton	90.00 at Chester, Penn.
Silica brick	net ton	45–55 at Mt. Union, Penn.

Standard size fire brick, 9 x 4½ x 2½ in. The second quality is $4 to $5 cheaper per 1000.

St. Louis—Fire Clay, $40 to $55.
Birmingham—Fire clay, $50; silica, $50; magnesite, $110; chrome, $165.
Chicago—Second quality, $25 per ton.
Denver—Silica, $35 per 1000.

RAILWAY TIES—For fair size orders, the following prices per tie hold:

	Material	7 In. x 9 In. by 8 Ft. 6 In.	6 In. x 8 In. by 8 Ft.
Chicago	Plain	1.48	1.33
San Francisco	Douglas Fir—Green	1.35	.96
San Francisco	Douglas Fir—Creosoted	2.75	1.92

Prices per tie at Missouri mills; St. Louis prices about 25c. higher:

Untreated A Grade White Oak 6x8x8		Untreated A Grade Red Oak 6x8x8	
No. 1	$0.70	No. 1	$0.55
No. 2	.80	No. 2	.65
No. 3	.90	No. 3	.75
No. 4	.98		
7x9x8 white oak			1.05
7x9x8 red oak, No. 4	.80	No. 5	.87

FLOTATION OILS—Prices of oils for flotation, in cents per gallon, in barrels:

	New York	Chicago In Bbl.	Chicago Car	Denver In Bbl. Lots	Denver In Carload Lots
Pure steam-distilled pine oil, sp. gr. 0.925-0.94	$0.67½–$0.70	$0.70	$0.65	$0.76	$0.62
Pure destructively distilled pine oil	.65 – .67½	.60	.57	.55	.....
Pine tar oil, sp. gr. 1.02 = 1.035	.38 – .40	.40	.38	.65	.....
Crude turpentine	.45 – .47	.70	.65	.60	.....
*Hardwood creosote, sp. gr. 0.96-0.99	.23	.40	.38	.42	.....

* F.o.b. Cadillac, Mich.

COTTON WASTE—The following prices are in cents per pound:

	New York		Cleveland	Chicago
	Current	One Year Ago		
White	11.00 to 13.00	13.00	16.50	12.00 to 16.50
Colored mixed	8.50 to 12.00	10.00	13.00	11.50 to 14.00

WIPING CLOTHS—Jobbers' price per 1000 is as follows:

	13½ x 13½	13½ x 20½
Cleveland	$52.00	$58.00
Chicago	48.00	50.00

EXPLOSIVES—Price per pound of dynamite in small lots and price per 25 lb. keg for black powder:

	Low Freezing 20%	Gelatin 40%	Gelatin 60%	80%	Black Powder
New York	.....	$0.29½	$0.34½	.....	$2.40
Boston	$0.23½	.26½	.31½	$0.35½	2.35
Cincinnati	.18½	.22½	.26½	.....	2.35
Kansas City	.20½	.25½	.30½	.38½	2.45
New Orleans	.20½	.24½	.28½	.....	.....
Seattle	.....	.25½	.32½	.....	.....
Chicago	.18½	.22½	.30	.36	2.35
St. Paul	.19	.24½	.30½	.....	2.45
St. Louis	.19	.25½	.30½	.36½	.....
Denver	.17½	.24	.29	.35	2.60
Dallas	.21	.25	.29	.39	.....
Los Angeles	.23	.29	.37	.....	3.10

CHEMICALS

SODIUM CYANIDE—New York price is 30c. per lb.; Denver, 42c.; Chicago, 31½c.; St. Louis, 31c.

SODIUM SULPHIDE—In New York the price per pound is 8½c. for concentrated, 4½c. for crystals. The St. Louis price is 10c. for concentrated, 20c. for fused; the Chicago price is 7½c. for concentrated, 3½c. for crystals. Concentrated comes in 500-lb. drums, the crystals in 440-lb. bbl.

ZINC DUST—For 350 mesh the New York price is 16c. per lb.; Chicago, 16c.; Denver, 14c. f.o.b. Pueblo; St. Louis, 13c.

ALUMINUM DUST—Chicago price is $1.65 per lb.

MINERS' LAMP CARBIDE—Prices net f.o.b. cars at warehouse points.

	Union 100-Lb. Drums Per Ton	Cameo 100-Lb. Drums Per Ton	Union 25-Lb. Drums Per Drum
East of the Mississippi, North of Chattanooga	$106.00	$101.00	$1.52
Southeastern portion U. S. A.	115.50	110.50	1.63
Texas (except El Paso)	124.00	119.00	1.74
El Paso, Texas	126.00	121.00	1.77
Denver, Colo.	124.00	119.00	1.74
West Coast	129.00	124.00	1.81